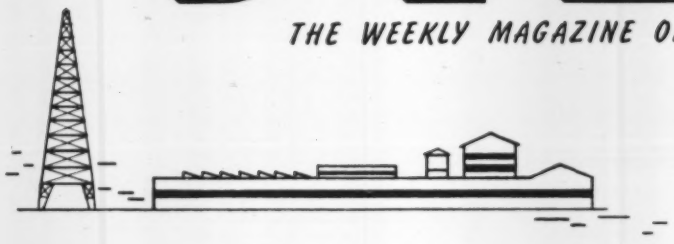
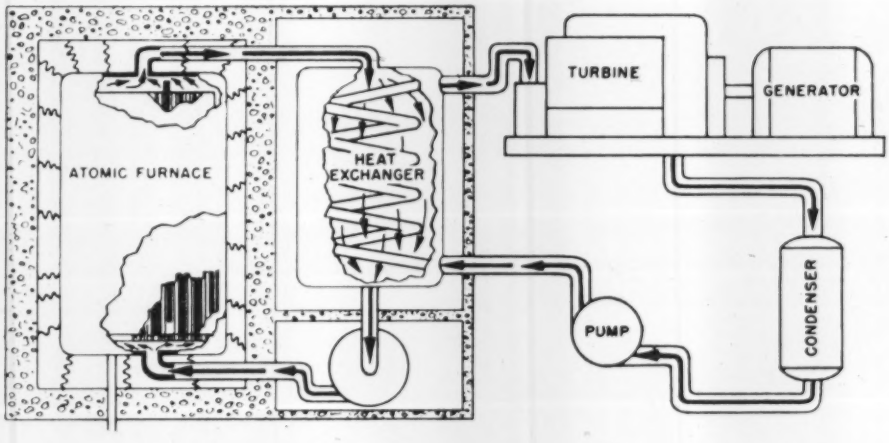
MARCH 2, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING





ATOMIC POWER IN INDUSTRY

Will atomic enterprise affect your business? For a down-to-earth appraisal turn to page 86

✓ POST-DEFENSE PLANNING
Only One in Four is Doing It, p. 57

✓ THE SPORTS CAR
How It Affects Detroit, p. 71

✓ CARBIDE STEPS UP DRILLING JOB
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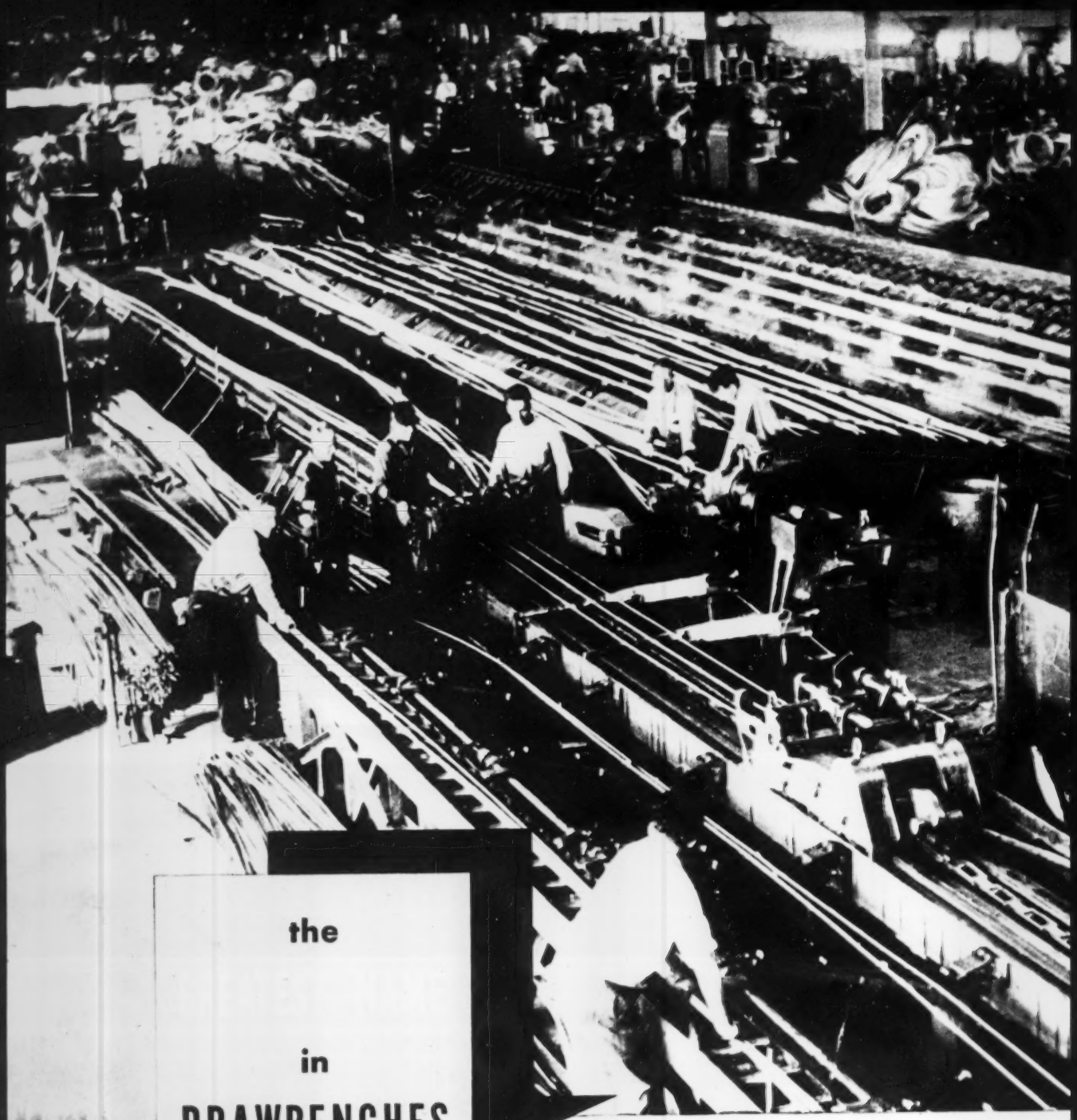


the

in

DRAWBENCHES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.

Societe de Constructions de Monthard, Paris, France — France, Belgium, Holland, Luxemburg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

Aetna Japan Company, Ltd., Tokyo, Japan — Japan.

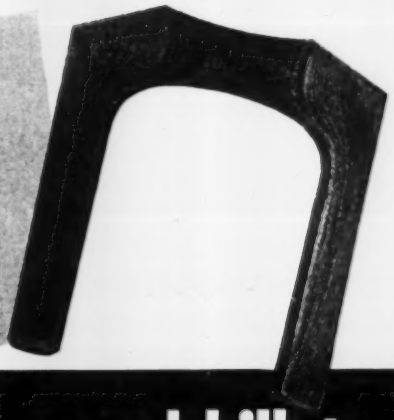
Hale & Kulgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

Aetna-Standard

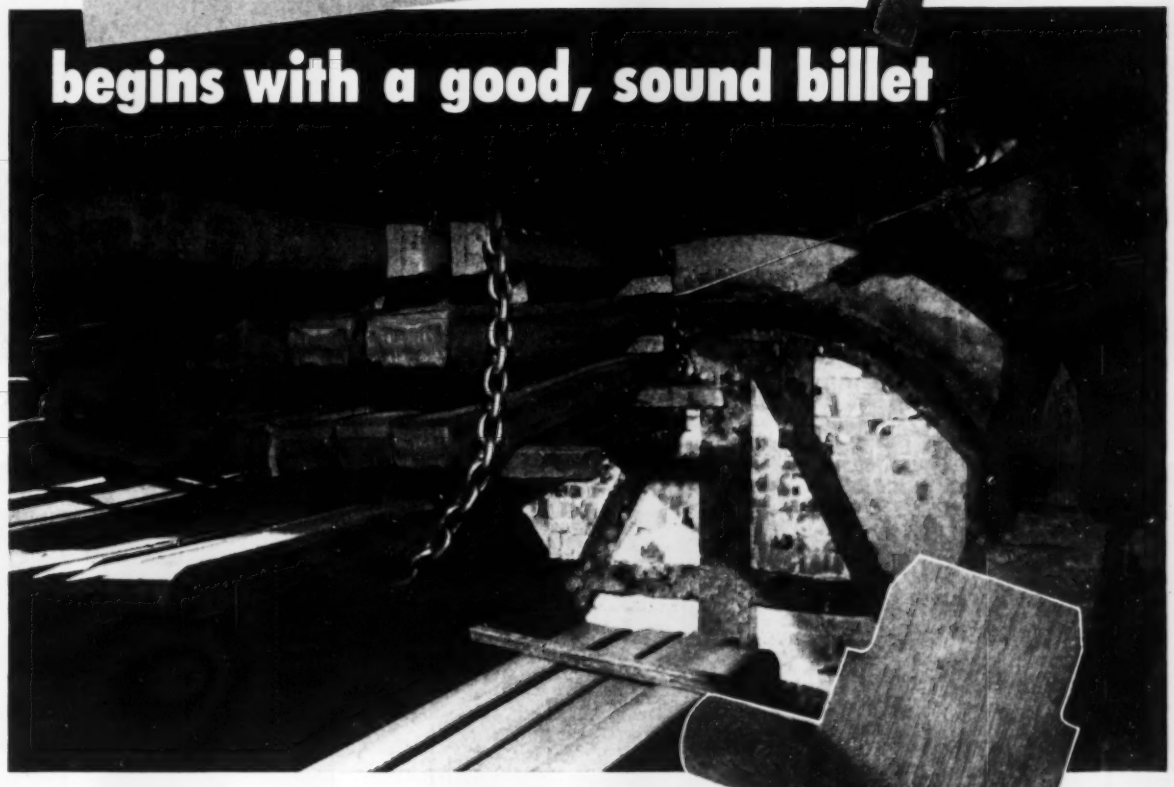
THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio • Ellwood City, Pennsylvania

Successful Forging



begins with a good, sound billet



At Bethlehem we take unusual care in producing alloy steels for forging purposes.

Chemical composition and grain size are closely controlled so that the forgings will respond to heat-treatment uniformly with minimum distortion. Billets are cooled slowly in bung-type furnaces, with separate cooling cycles being used for each composition, to avoid cooling cracks. Rolled billets are subjected to macro-etch tests to insure internal soundness. Nothing is overlooked that might improve the overall quality.

Bethlehem Alloy Steels will go a long way toward helping you turn out a higher percentage of acceptable forgings. We manufacture all of the AISI grades, as well as carbon and special steels.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEELS

Here's how you can save time and money with
TOCCO*
Induction Brazing
Packard engineers saved $1.74 per part when this ultramatic transmission shaft was redesigned from a forging to a steel shaft and casting. They saved $74,325 in equipment and tooling, too.
Auto parts manufacturer saves $2000 monthly brazing shanks on hi-speed lathe tool stubs. Formerly these $17.00 tools had to be discarded when worn down to 4". Now they use up 100% of the tool.
American Emblem Co. reduced solder cost 50%; cut repairs and rework due to misalignment of parts 98% and doubled output when they switched from hand soldering to automatic TOCCO soldering.
Commercial Shearing and Stamping Co. changed from welding to TOCCO brazing these hydraulic cylinder assemblies and doubled production while cutting unit costs 50%.
Nash Motors changed from a hand torch to TOCCO Induction brazing of drain flanges to oil pans. Labor and material costs dropped from $12.75 to $4.90 per hundred—a cut of 60%. Hourly production more than tripled.
Norris-Thermador Corporation switched from arc welding to TOCCO Induction Brazing of this bushing and clamp assembly. Result: costs reduced from $46.44 to $31.73 per 1000 parts—a 32% saving.

If your product involves brazing, heat-treating, forging or melting of ferrous or non-ferrous metals, similar savings of time and money can probably be uncovered in your plant, too. A TOCCO engineer is glad to survey your plant without obligation, of course.

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FREE BULLETIN

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Please send free copy of "Typical Results of TOCCO Induction Brazing and Soldering."

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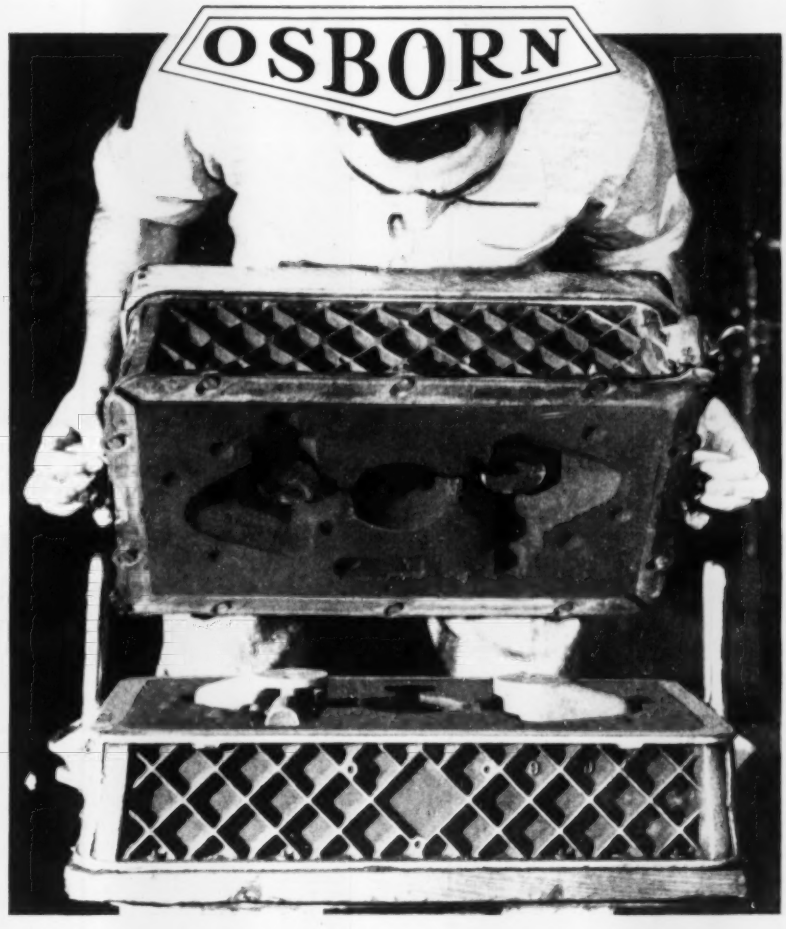
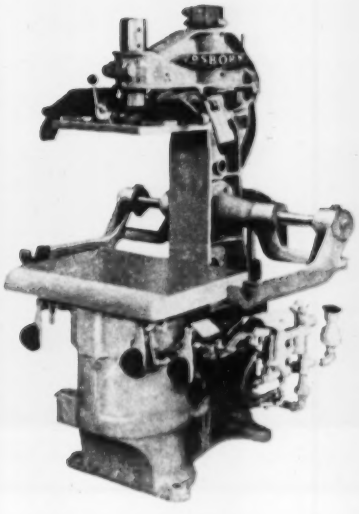
Position_____

Company_____

Address_____

City_____ Zone___ State_____





MECHANIZES MOLDING OPERATIONS With Osborn's Rota-Lift it is now economical to machine mold large castings formerly made on the bench or on the floor from match-plate patterns. The Rota-Lift mechanically handles the mold as well as rams the sand.

INSIDE STORY...

How quality castings can cut machining costs

Look inside your molds for clews . . . castings can be only as accurate and uniform in size as the molds in which they are produced. Simply by improving the quality of your foundry molds through use of modern molding and core blowing machines, it is possible to reduce both machining and initial casting costs.

Uniformity in castings produced from precision sand molds cuts machining costs three ways:

First, less time is needed to load uniform castings in chucks or holding fixtures. Extra grinding operations on oversized castings are eliminated.

Second, costly scrap losses from porosity, core shifts, or sand spots are greatly reduced or eliminated entirely.

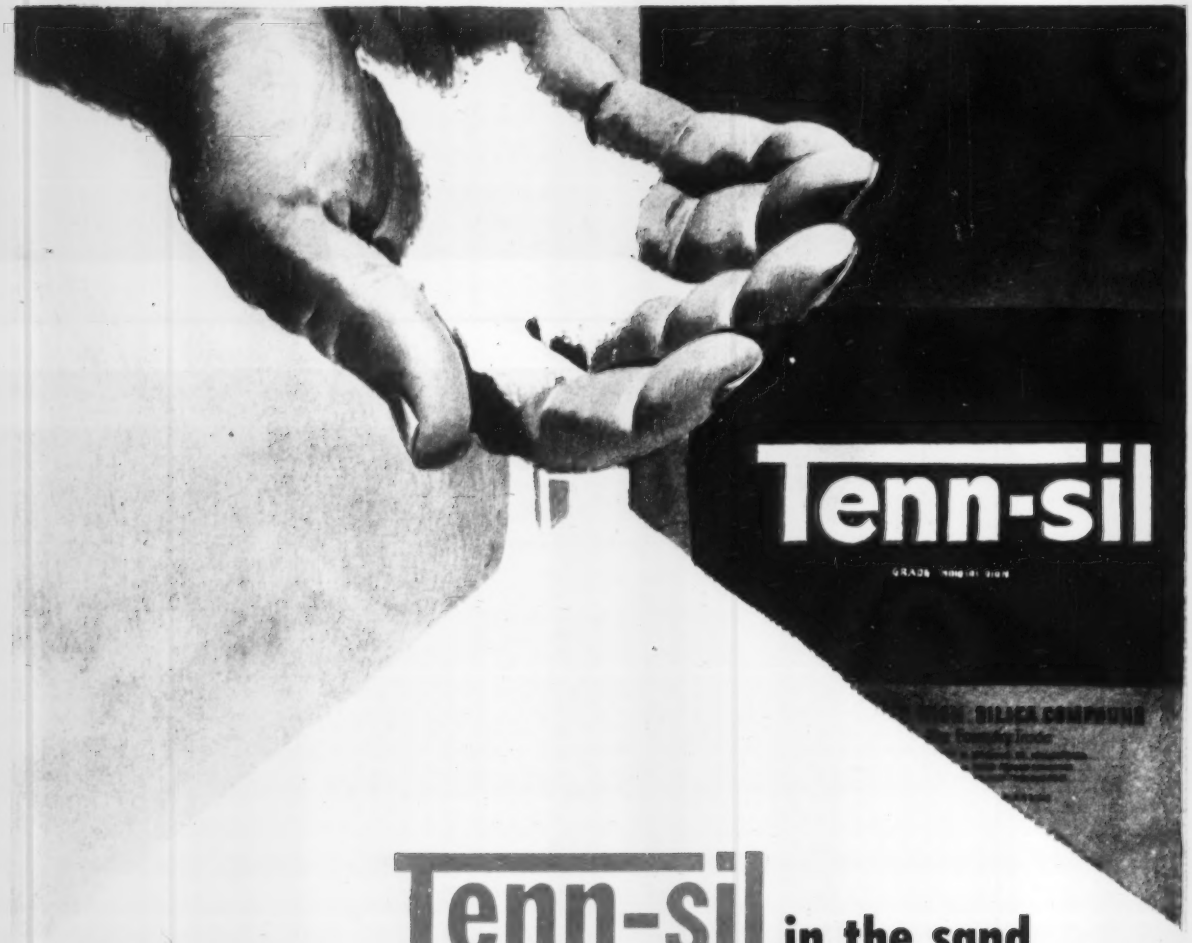
Third, uniform castings cut machining time . . . less metal is needed for finishing.

Consult a factory-trained Osborn molding specialist . . . learn what new mechanical advancements can now be applied to your operations to improve the quality of your molds, simplify production and cut costs. Write *The Osborn Manufacturing Company, Dept. EE-2, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

BLOWS CORES AUTOMATICALLY— Automatic controls on the Osborn Core Blower preset the machine cycle as well as free the operator to perform other tasks while the core is being blown automatically. In many cases an unskilled operator becomes a top producer.

Osborn Molding Machines

MOLDING MACHINES . . . CORE BLOWING MACHINES . . . INDUSTRIAL BRUSHES



Tenn-sil in the sand means quality in the castings

Tenn-Sil, additive to foundry sand, improves the quality of the end product and reduces the danger of casting defects.

Tenn-Sil No. 1 . . . *Reduces expansion and, by increasing hot deformation, acts as a cushioning agent in the elimination of rat tails, buckles and certain types of scabs. It is also useful for insulating hot metal when delays in pouring occur.*

Write for test report T- 3028 for further details.

Tenn-Sil No. 2 . . . *Constitutes a specific improvement over Silica Flour for co.e-room operations and steel facing sands inasmuch as it is a neutralized high Silica compound containing no free Silica and therefore offers no silicosis hazard to the operators.*

For properties of facing sands containing Tenn-Sil No. 2 write for test report T-3070.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE TENNESSEE

This Week in Metalworking

STEEL

Vol. 132 No. 9 Mar. 2, 1953

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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Selected condensed news items reflecting the possible future course of the metalworking world

As the Editor Views the News 53

Windows of Washington 64
Washington Editor E. C. Kreutzberg describes events of national interest in the capital city

Mirrors of Motordom 71

The Business Trend 75
Facts and figures report and graphically illustrate trends of industrial production

Men of Industry 79
A popular feature of STEEL reports late news on changes in personnel

Production-Engineering News at a Glance 85

The Facts About Atomic Power in Industry 86
What is being done and what can be done to cash in on the potentialities of atomic power. Incentives are many

Carbide Steps Up Drilling Job 93
Adding carbide tips to the drills resulted in high speed and feed on cast iron. Better life between grinds, too

Progress in Steelmaking 96
Flicker Control in Arc Furnace Power Supply—Concluding portion evaluates a particular system impedance

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Editorial, Business Staffs 16. Advertising Index 181. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

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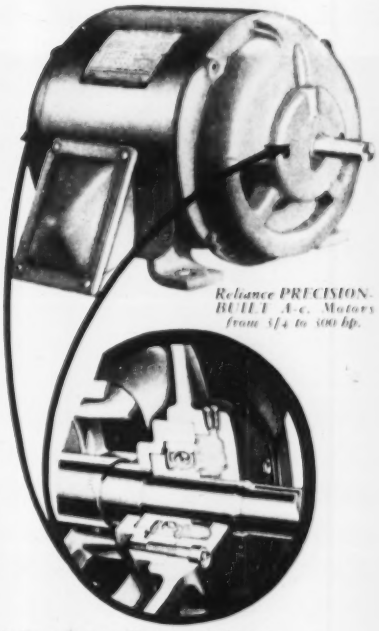
Pre-lubricated Bearing Design in

RELIANCE MOTORS

provides

more operating hours without re-lubrication!



Reliance PRECISION-BUILT A-c. Motors from 1/4 to 500 hp.

Reliance Bearing Design, including extra-large grease reservoir, provides longer bearing life.

RELIANCE Precision-Built MOTORS

Original, factory lubrication permits more operating hours without re-lubrication than that of any other pre-lubricated bearing. From a larger grease reservoir than provided with any standard bearing, Reliance double-shielded bearings automatically take on new grease as needed. And the Reliance design not only *keeps* bearings lubricated, but makes it *impossible to overgrease* a Reliance Motor. Get the convenient chart on which you can check these and other features which combine to give you 15 important advantages in the Reliance Pre-lubricated Bearing Design . . . write today for Bulletin B-2201.

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"All Motors are NOT Alike"

• Print up to
• 2000 feet per minute
with the
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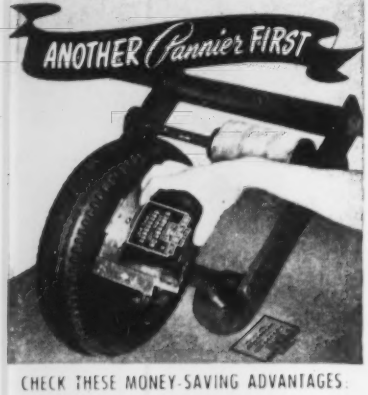
AUTOMATIC SHEET and STRIP
"Master Marker"*
...make complete die change in 30 seconds!

Pannier Engineers, through constant research and experimentation, have successfully developed a marking device for efficiently and automatically printing sheets and strip made from any kind of material.



CHECK THESE MONEY-SAVING ADVANTAGES:

- Prints *all* materials — any thickness.
- Driven by product or conveyor at production-line speed — up to 2000 feet per minute with safety. (Wheel need not ride on product.)
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- Interchangeable Dovetail National Type for heat numbers, etc.
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- Full counterweight on drive wheel axle for perfect balance.
- Friction drive, Alemite-lubricated-roller-bearing wheel with 30-35,000-mile-life rubber tire.
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Behind the Scenes...

Gutter Snipes

Every Wednesday night at the Playhouse Square Bowling Emporium, here in Cleveland, 60 Pentonites representing all publications and departments of the Penton Publishing Company meet in friendly rivalry. The league is for "Hims and Hers" and so secretary, linotype operator, editor, elevator operator, and circulation manager all practice the elusive art of picking up spares together. Fortunately this gang knows a good deal more about printing and publishing than it does about bowling with individual averages running the full range from a high of 173 to a low of 72. Word around Playhouse Square is that the pin boys sign up for duty on Penton night weeks in advance. It seems that they have it pegged as a breather what with so few pins being knocked down during the course of the evening . . .

Long on Market Research

If you move on about ten pages to the right of here and study STEEL's business staff you will notice this week that there are a couple of changes. We are happy to announce that we now have not only the best but the biggest Market Research Manager in captivity, N. R. Ladabouche stands a good six feet five in his size 15 socks, and tips the scale at over 200. They apparently ate pretty well up in Worcester, Massachusetts where he grew up and he apparently kept on getting his vitamins as he went through Niagara University and the University of Pennsylvania where he got his Master's Degree in marketing. After a spell of teaching and selling, he did a stint with Robert Heller and Associates, all of which he enjoyed very much. He brings to STEEL a problem, however. His first name is Newman so he has been known either as "New" or "Lad". Someone discovered that the R. stands for Robert and started to call him Bob around the shop. That is all well and good except he doesn't know just what to answer to. Any suggestions?

In Love With Amy

Another new name on the masthead is Amy Lombardo. Amy moves in to take over the job of handling our mail and list service. She has worked on the Continuing Penton Census of Metalworking for the last four years and knows every nook and cranny of that operation. She has taken time out to study commercial law out at John Carroll University in the evening, and is a very busy young lady right now checking up on the current growth of the metalworking industry.

Teen-age Lingo

Add this one to the teen-age lingo: *There's malaria in the area!*

Puzzle Corner

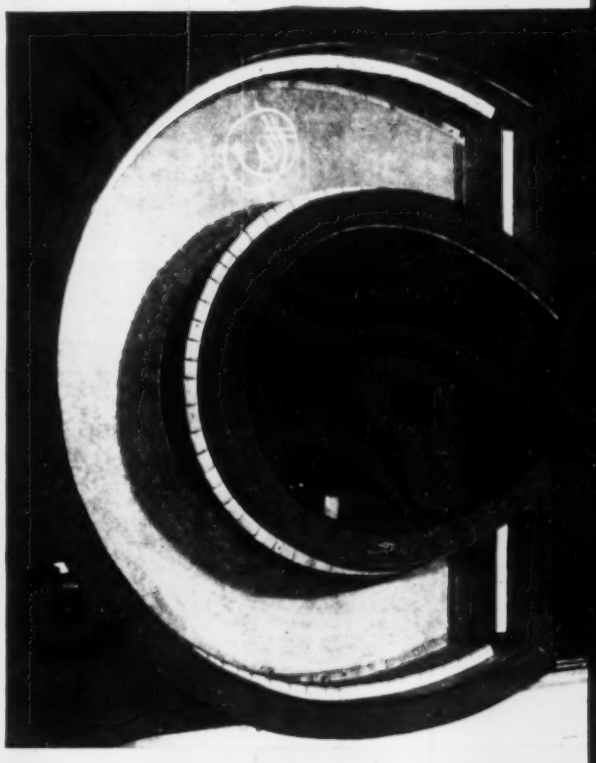
You can rest assured that we aren't going to question again whether you puzzle workers know which end is up. When we asked February 16 about the number of men Sam is trying to march it was of course exactly the same puzzle as the bottle cap job, and brother did we ever get told off. Walter S. Wallace, George E. Dunn, R. L. Osborne, A. W. Everest, C. R. Wylie, W. B. Baisch, James T. MacKenzie, Robert E. Adel, George G. Snyder, F. Reuter, John G. Stevenson, George W. Frederick, Tod Morgan, L. W. Davis, L. D. Rice, R. M. Walbeck, T. R. Sessums, Blaine McKee, O. A. Davis, J. C. Casper, F. Don Bradshaw, Paul Shoemaker, and a half dozen others all gave us h- - -, as well as the right answer. Brothers Snyder and Sessums were tied with their telegrams so they each get a copy of the Specifications Handbook by return mail.

Now let's try another variety: A train leaves New York every hour on the hour headed for Chicago. At the same time a train leaves Chicago every hour on the hour headed for New York. It takes just 24 hours for the trip in either direction. Not counting the train arriving just as you leave Grand Central in New York and not counting the one that will be leaving the La Salle Street Station in Chicago just as you arrive, how many trains will you pass (going in the other direction) during your trip from New York to Chicago?

Shrdlu

(Metalworking Outlook—Page 49)

SHARON Galvanite*



Leading Sign Builder Chooses Galvanite*

Builders of signs for outside display consider atmospheric conditions their greatest single enemy. The snow, sleet and wind conditions in the north and east, the tremendous heat in the south and southwest, the salt air of the oceanic areas and the destructive fumes of industrial concentration all must be considered when designing and building a display for national consumption.

That's why a great many sign builders have turned to Galvanite* — the weather-fighting, zinc coated steel developed by Sharon to add life to steel where it is subjected to the constant ravages of the atmosphere. Galvanite* is used to a great extent in the automotive, appliance and building industries because it is easy to use, it holds its coating under severe forming conditions and provides an excellent surface for enameling, painting or further finishing.

If you are looking for a good, serviceable, weather-resistant steel be sure you have all the facts on Sharon's great Galvanite*. Contact the Sharon office nearest you, or write direct for fully explanatory Galvanite* booklet.

*TM

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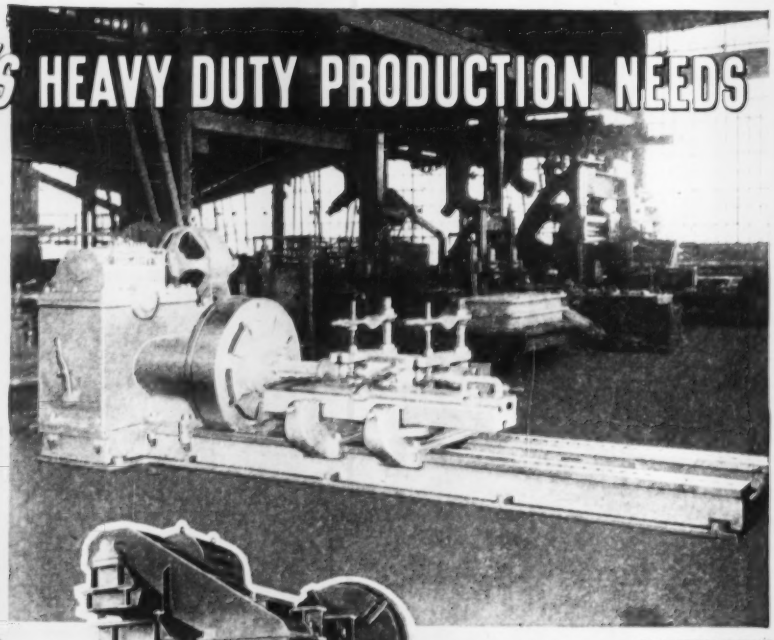
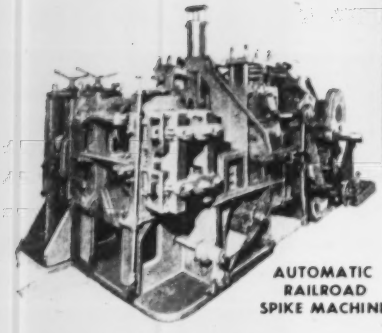
SHARON STEEL CORPORATION *Sharon, Pennsylvania*

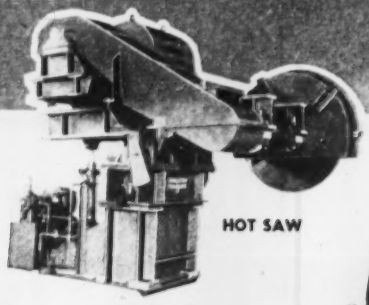
SERVING TODAY'S HEAVY DUTY PRODUCTION NEEDS



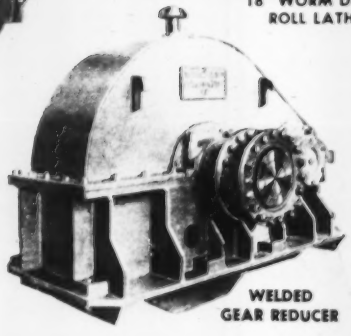
18" WORM DRIVE ROLL LATHE



AUTOMATIC RAILROAD SPIKE MACHINE



HOT SAW



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BILLET EJECTORS—PINCH ROLL STANDS
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Continuous PICKLING Lines—ROLLER LEVELERS
FURNACE Charging Equipment—Furnace Pushers
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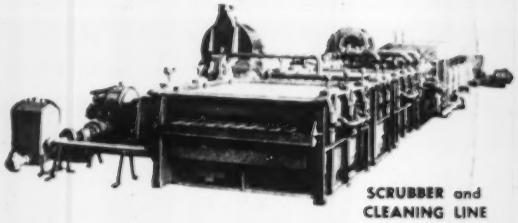
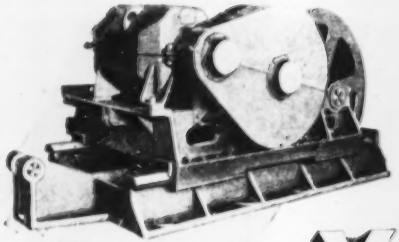
Stretcher Levelers—Angle and Shape Straighteners
Rolling Mill Tables—Gear and Individual Motor Types
DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings



SCRUBBER and CLEANING LINE



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GALVANIZED MB
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- Corrosion resistant
- Extra strength

Leading makers of flexible control cables specify Keystone Galvanized MB Spring Wire for uniform coiling, improved corrosion resistance and extra strength. The outstanding quality of this wire is governed by Keystone's unique method of *galvanizing the wire before it is cold-drawn.* The drawing process smooths and hardens the galvanized finish — improves its lasting qualities. Keystone Galvanized MB Spring Wire is also furnished in Type 2 and Type 3 heavy weight zinc coatings before drawing to meet specified salt spray tests.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS TO THE EDITORS

Executives Need a Raise?

I noticed in your Feb. 2 issue that there is a booklet "Executive Pay Plans" (p. 64) by W. J. Casey and J. K. Lasser of Business Reports Inc. Where might we obtain one of these booklets?

W. M. Russell
Delo Screw Products Co.
Delaware, O.

. . . we are interested in obtaining a copy of this study.

M. H. Schellenberg
secretary-treasurer
L. R. Kerns Co.
Chicago

• *Write to Business Reports Inc., Roslyn, N. Y.—ED.*

Scrap Pile Grows

Please send me three copies of your insert "More Scrap for More Steel" (Jan. 12).

A. W. Gudal
Lukens Steel Co.
Coatesville, Pa.

. . . I would greatly appreciate receiving a copy of "More Scrap for More Steel."

K. A. Cruise
purchasing agent
Kansas City Division
Bendix Aviation Corp.
Kansas City, Mo.

. . . we would greatly appreciate receiving a reprint of that insert.

Jack Baltes
John Oster Mfg. Co.
Racine, Wis.

• *Sent.—ED.*

Selling to Uncle Sam

I am mighty glad to see the subject of selling to the procurement agencies of the government brought out into the open in your editorial "Mr. Wilson's Opportunity" (Feb. 16, p. 39).

The methods of purchasing and executing a contract with the government differ so vastly from those used in private industry that I think you understate in saying 90 per cent of the sellers would prefer dealing with a company like General Motors or any of our steel companies.

The amounts of red tape such as a 52 page contract, the numbers of copies of contracts and specifications that must be handled, the bidding practices, and inspections, are all faulty, more or less.

Renegotiation is simply a pain in the neck and accomplishes little. In our renegotiation proceedings carried on with the Ordnance Association, and later with R. F. C., considerable sums of money were paid back to the government. But they were immediately deducted from

Continued on following page

No ONE chain serves every purpose

LINK-BELT offers the right chain

. . . engineered for your requirements

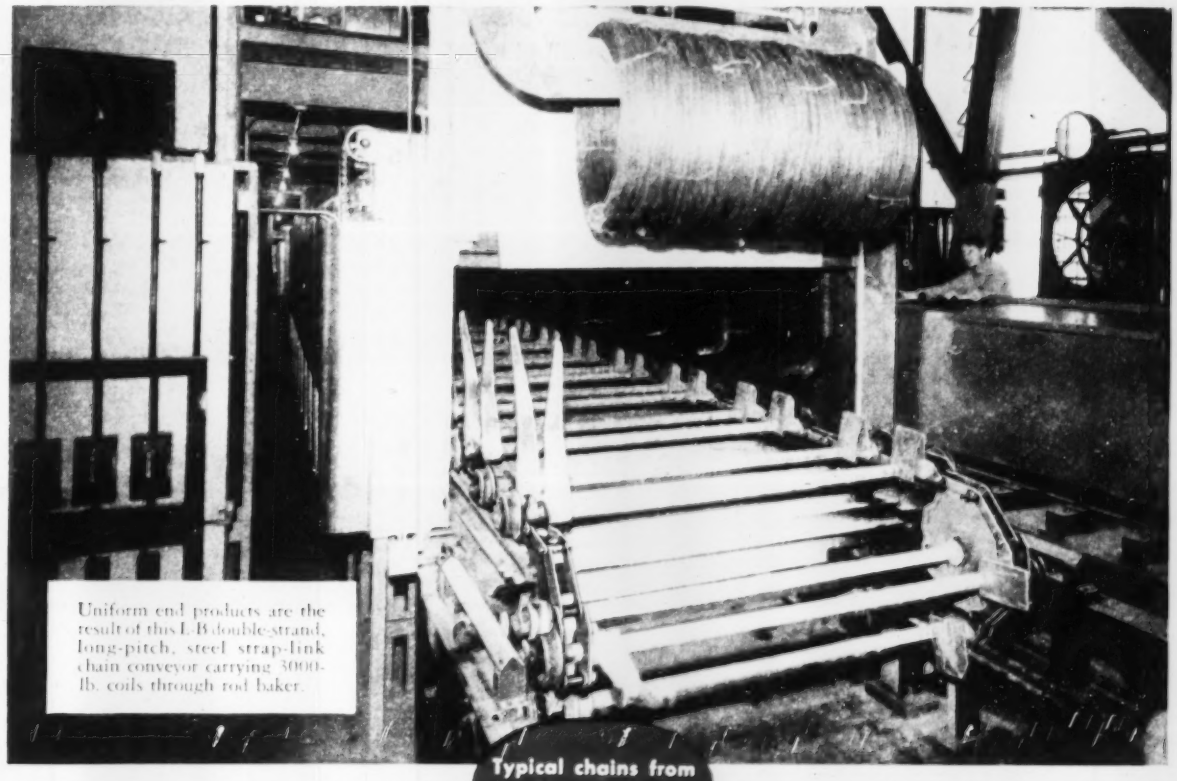
Don't settle for a "cure-all" chain to handle every job. Different types of chain have different characteristics. That's why Link-Belt makes a complete line of chains. Our engineers can recommend the correct type of chain to fit your particular needs . . . the one that does your job best.

Equally important is your assurance that *any* chain with the Link-Belt name will give you longer chain life. Accurate control of raw materials and processes . . . plus manufacturing refinements add up to the highest standards.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, factory branch stores and distributors in principal cities. 12,731

LINK-BELT

CHAINS AND SPROCKETS



Uniform end products are the result of this L-B double-strand, long-pitch, steel strap-link chain conveyor carrying 3000-lb. coils through rod baker.

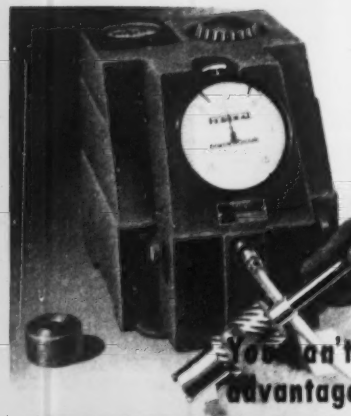
Typical chains from the complete LINK-BELT line

Class SS bushed roller chain with straight sidebars —for practically any conveying or elevating service

Class C combination chain — popular, durable low cost design for elevators and conveyors.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds

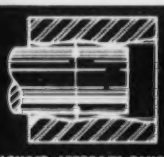
Transfer chain with tilting dogs—for plate and slab travel, loads up to 500,000 pounds



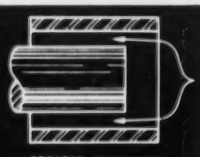
You're the loser if you don't use DIMENSIONAIR

You can't realize the value of these advantages until you use this air gage

PRECISELY CALIBRATED DIAL
Each division on *entire* dial is actually 50 millionths. *Not* arbitrarily divided between limits like old-style GO, NO-GO Air Gages.



LONGER APPROACH RANGE
Approximately .002" • Plug fitted better to suit tolerances • More leeway before reaching finished size • Use same plug on rough and finished dimensions.



GREATER CLEARANCE
.0018" up to .0038" • Easier to insert plug and check taper, out-of-round, etc. • Plug doesn't stick in irregular-shaped holes.

STEADY, STABLE POINTER
Doesn't fluctuate with air line pressure variations • No pointer flutter.

LONGER PLUG WEAR
Jet faces are deeper — a feature which really saves plug costs.

ONE MASTER
This is the only air gage built with enough precision to permit use of only one master.

ASK THESE COMPANIES HOW THEY LIKE THE DIMENSIONAIR

GENERAL ELECTRIC COMPANY
FORD MOTOR
EASTMAN KODAK COMPANY
PONTIAC MOTOR DIV.
TORRINGTON MFG. CO.
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CUMMINS ENGINE CO., INC.
JONES & LAMSON MACHINE CO.
MONROE CALCULATOR CO.
WESTINGHOUSE ELECTRIC CORP.
DUMORE COMPANY
BENDIX AVIATION—UTICA DIV.
SONOTONE CORP.
LINK-BELT COMPANY
KOPPERS CO., INC.

The FEDERAL Dimensionair *is* an exceptional air gage with *many outstanding* advantages. We ask you to try the Dimensionair yourself and to compare it with any other air gage. Write today for complete information and prices. Federal Products Corporation, Providence 1, Rhode Island.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES

FEDERAL PRODUCTS CORP., 1213 A Eddy St., Providence 1, R. I.

TRY IT — AND BE CONVINCED!

I would like a demonstration of the Federal DIMENSIONAIR.

NAME
COMPANY
STREET
CITY STATE

LETTERS

Concluded from preceding page

income tax and that would have taken all but from 6 cents to 10 cents on the dollar anyway.

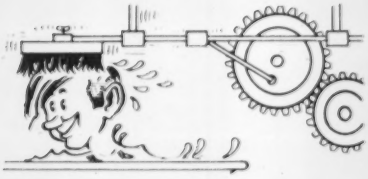
When we receive an order from a steel company for an open hearth or a blast furnace, the whole proposal doesn't amount to more than 10 or 12 pages, and if there are minor changes, provision is made in the contract for that.

What the government needs is a purchasing department such as our large corporations have. A proposal from any number of large concerns will consist of from 6 to 12 pages and an order doesn't generally cover more than 2 pages and mostly one will suffice, with references to the original contract.

Mr. Wilson is thoroughly familiar with such procedure and this idea of letting every department try to buy the equipment or supplies is not economical to say the least. Skilled purchasing agents working under a Director of Purchases would save a lot of money. I do hope this editorial is read very carefully by Mr. Wilson.

Sam F. Keener
president
Keener Industries
Salem, O.

Cool Cleaner Not Washer



I noticed in your article "No Heat Needed" (Dec. 15, p. 103), there is a new power washer used at room temperature. I am very much interested in receiving additional information on this subject and would appreciate knowing the name of the manufacturer.

W. G. King Jr.
vice president
Automotive Rebuilders Inc.
Richmond, Va.

• *Our Production and Engineering News item "No Heat Needed" should not have given the impression that a new power washer is available. What should have been emphasized is the cold cleaner mentioned in the third line which makes possible the reduction of working temperatures. E. F. Houghton & Co., Philadelphia, is the manufacturer of that cold cleaner.—ED.*

Serving Foreign Readers

Subject to your kind permission, I should like to sell typewritten German translations of certain articles published in STEEL to German and Austrian industrialists, manufacturers and research workers. Of course, I would make it a point always to indicate where the original article was published.

Hubert Finger
Postfach 9
Vienna, Austria

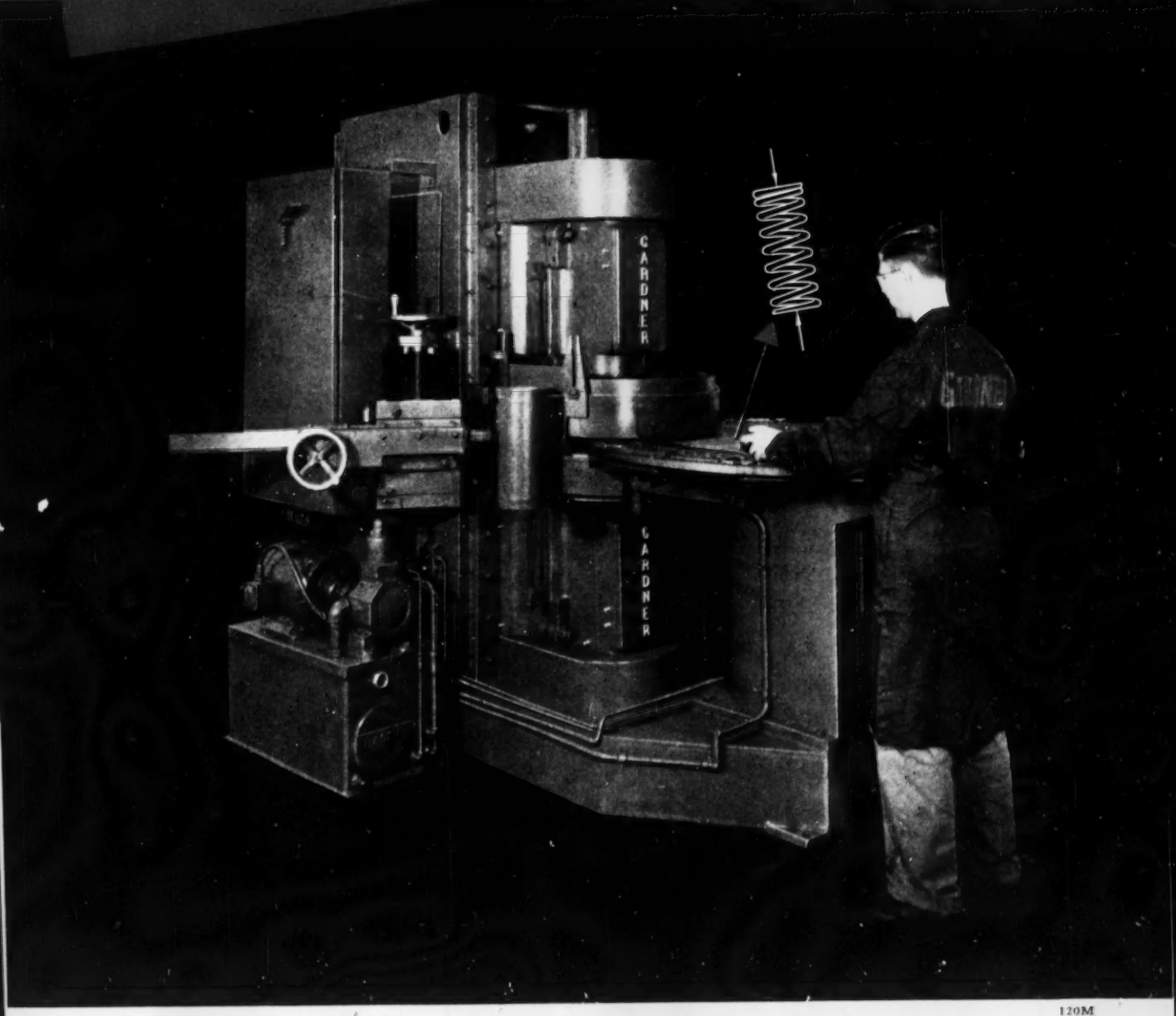
• *You have permission to make abstracts of articles published in* STEEL *provided credit is given in each instance so that readers could contact us in case they require further details.—ED.*

GARDNER Grinders

precision disc

Grinds 2000 Coil Springs Per Hour

TWO parallel surfaces ground in **ONE** operation



120M

Write for new catalog

WORK DATA

MACHINE	Gardner No. 211 Vertical Double Spindle Grinder
PART	Coil Springs .715" O.D. x .750" long
MATERIAL	3/16" wire
STOCK REMOVAL	Approx. .300" over all
TOLERANCES	1/2° to 1° for squareness; .004" for uniformity
PRODUCTION	2000 per hour

GARDNER MACHINE COMPANY

420 East Gardner Street · Beloit, Wisconsin, U. S. A.

BLISS MILLS PACE REVERE

IN ILLINOIS...

Revere Copper and Brass Incorporated is not one to rest on the laurels of its 150-plus years of experience and accomplishments. Revere is constantly expanding and improving its facilities.

That's why Revere's recent effort to get added rolling efficiency and capacity resulted in installation of four new Bliss mills in three different manufacturing divisions: two mills in Rome, N. Y., and one each in Chicago and Detroit.

All the Bliss units are four-high reversing mills for reducing copper and brass. Each is a wet mill having a coolant system that permits exact control of the roll crown, in addition to cooling strip. And each is equipped with expanding mandrel reels—used both for tension and pay-off—and coil buggies for each reel.

Back-up rolls are driven instead of work rolls. Since mill speed depends on peripheral speed of the back-up roll, work rolls of varying diameters (5¼" to 8") can be used without affecting operating speed of the mill.

Revere uses the mills to reduce hard copper from 0.030" to 0.015" and from 0.025" to 0.010". Both copper and brass are rolled to gages in the 25-inch width, as light as 0.004". Brass is reduced 50 to 60% between anneals.

You, too, can look to Bliss to fill your major rolling mill needs. Whether it's a hot mill or a cold mill...brass, copper, steel or aluminum...breakdown, rundown or finishing... Bliss can build it. See the complete line in our illustrated Bulletin 40—yours for the asking.

E. W. BLISS COMPANY

GENERAL OFFICE: CANTON, OHIO

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Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. **West Coast Representatives:** Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. **Other dealers** in U. S. cities and throughout the world.

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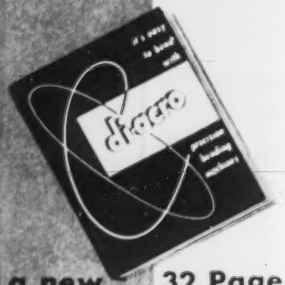
MICHIGAN...NEW YORK

Remember:
for Presses, ROLLING MILLS
...and Special Machinery...

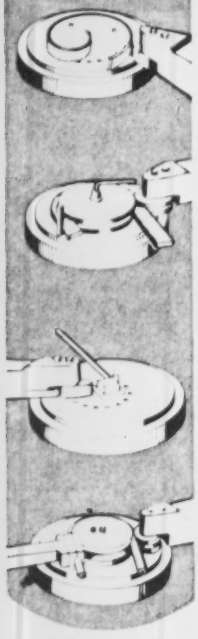
It's Bliss

"it's easy to bend"



a new **BENDING** **32 Page MANUAL**

by the originators of "Die-less Duplicating"

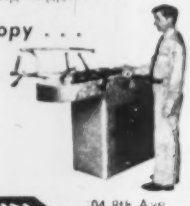


This instructive and authoritative booklet will quickly prove itself indispensable wherever bending is done or is needed. It brings you a veritable gold mine of tested authentic bending methods applicable to any rotary type bender. The proper bending technique may frequently offer a new approach to an old problem by simplifying product design and cutting production costs.

The exact methods of producing various types of bends in a wide range of materials are illustrated, step by step, with over 90 diagrams and charts together with valuable tooling suggestions.

You'll want a copy . . .

Mail your request today.



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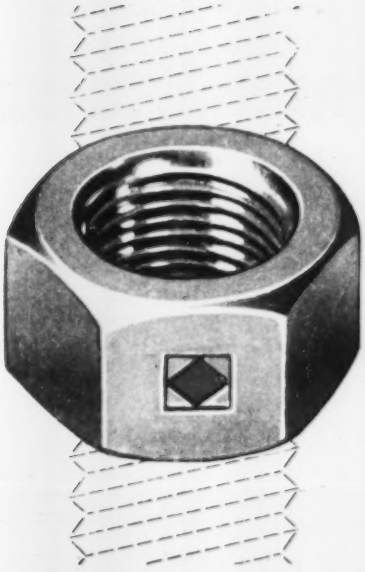

HERE'S THE LOCK-NUT TO USE FOR AUTOMATIC ASSEMBLY...

The Republic Upson "Nylok"* Nut

12 WAYS BETTER

Assemble from either end
Can be re-used
Non-galling
Best wrenching characteristics
Won't damage threads
No special know-how
No special tools
One piece
Ideal for mechanical feeding
No lubricant needed
Cold-forged
Lock in any position

● You can feed Republic Upson "Nylok" Nuts mechanically at full production speeds through your automatic assembly lines. Or use them manually for piece-work assembly. There's no "This Side Up" to Republic Upson "Nylok" Nuts . . . they go on easily.

What's more . . . the nylon plugs keep these lock-nuts tight wherever you stop wrenching. And they are easy to back-off when the time comes. Can be safely *re*-used, too.

WRITE FOR SAMPLES, mentioning sizes required.

SIZES: Light series tapped ¼" thru ⅜" Regular series tapped ¼" thru ½"
Light thick series tapped ¼" thru ½" Heavy series tapped ¼" thru ½"

Investigate their advantages on your product

REPUBLIC STEEL CORPORATION
Bolt and Nut Division • CLEVELAND 13, OHIO
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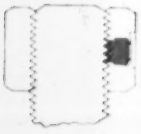


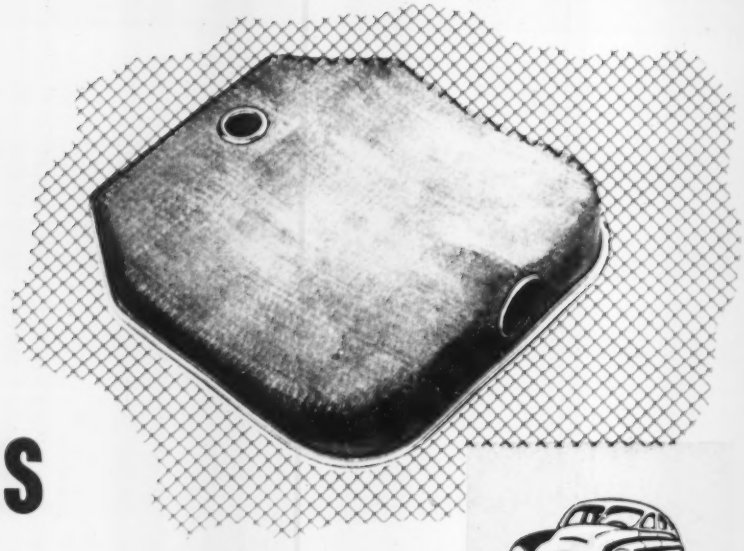
How the "Nylok" principle works...

A nylon plug inserted in one side of the cold-forged nut forces all the threads opposite the plug into tight metal-to-metal contact with the screw threads as the nut is turned on.

* U. S. Pat. No. 2,462,693 and pending applications

Republic
REPUBLIC STEEL
UPSON QUALITY BOLTS AND NUTS

for *better* OIL STRAINERS in automatic transmissions

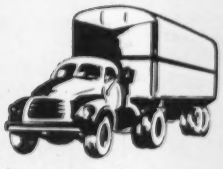


Cleaner oil betters performance, lengthens life. But an oil strainer can be no better than its wire cloth. So what? So *what* wire, or rather *whose* wire, makes a big difference.

Reynolds Wire Cloth is made to meet special-needs demands—all the way! From metal to mesh . . . from wire to weave . . . from ductility to durability. Its specifications are *your specifications*—its quality matches your products' quality. In any industrial application — automotive to agricultural.

Fifty-four—that's the measure of Reynolds wire cloth manufacturing experience, *in years*. By any other yardstick Reynolds measures up—from research to reliability. Put your problem to Reynolds engineers. No cost or obligation.

Automobiles



Trucks

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Tanks

Locomotives

Reynolds WIRE CLOTH protects performance

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO., **DIXON, ILLINOIS**

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ATHENIA STEEL...*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
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NS NATIONAL-STANDARD Company NILES, MICHIGAN

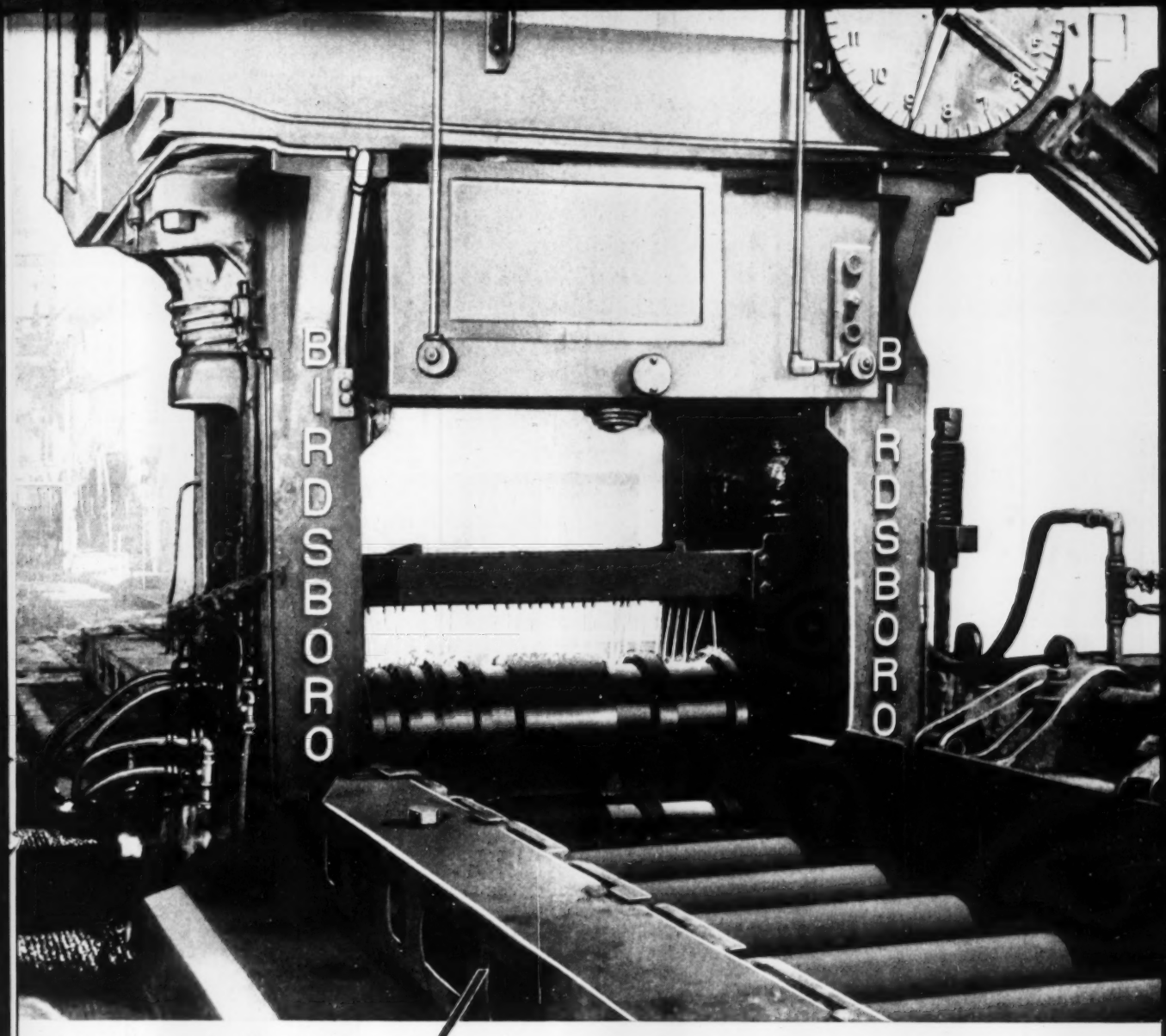

Illustration shows the 22" two-high Reversing Blooming Mill

SMALL, TWO-HIGH REVERSING MILLS

FOR THE ROLLING OF SEMI-FINISHED PRODUCTS

designed & built by

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA.

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MM-27-53

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TO AVOID AIR LINE TROUBLES

...Use the know-how of your HANSEN Representative

THE HANSEN REPRESENTATIVE—

Quick-Connective Couplings Are His Business

BUT SO ARE AIR LINE PROBLEMS

The main job of the Hansen representative is to supply you with exactly the right couplings for your particular requirements—where quick connection and disconnection will save you time and money.

There are, however, hundreds of plants that regularly make use of his experience to improve the overall performance of their fluid line circuits. Frequently when trouble arises, he can make suggestions which will effectively correct your difficulties.

From years of experience in close contact with many types of hook-ups, both large and small, he can advise you on how to make pipe connections for proper take-off, how much and in what direction to pitch your lines, and where and how to install drains—all designed to give you more efficient, trouble-free performance of your air-operated devices.

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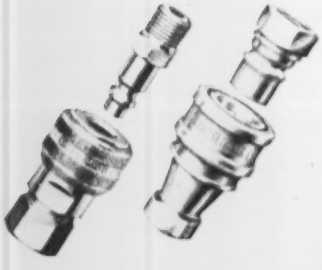
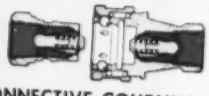


QUICK-CONNECTIVE FLUID LINE COUPLINGS

1. QUICK CONNECTION AND DISCONNECTION 2. INSTANT AUTOMATIC FLOW OR SHUT-OFF

One-Way Shut-Off

Two-Way Shut-Off



ALSO STRAIGHT-THROUGH QUICK-CONNECTIVE COUPLINGS

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THE HANSEN MANUFACTURING COMPANY

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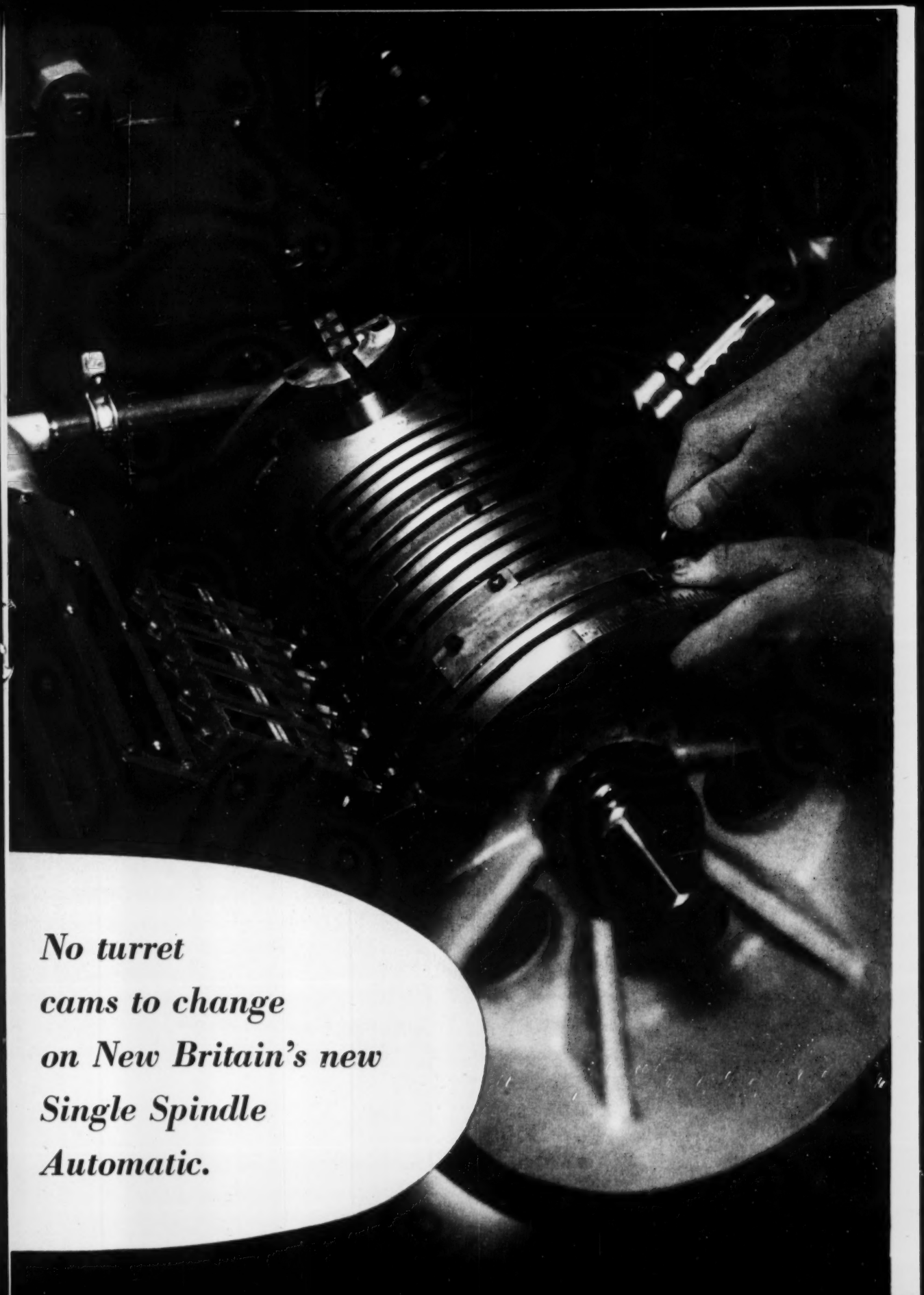
No turret
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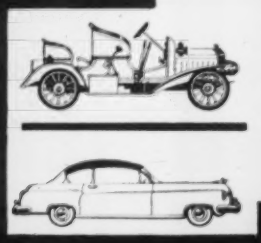
on New Britain's new
Single Spindle
Automatic.



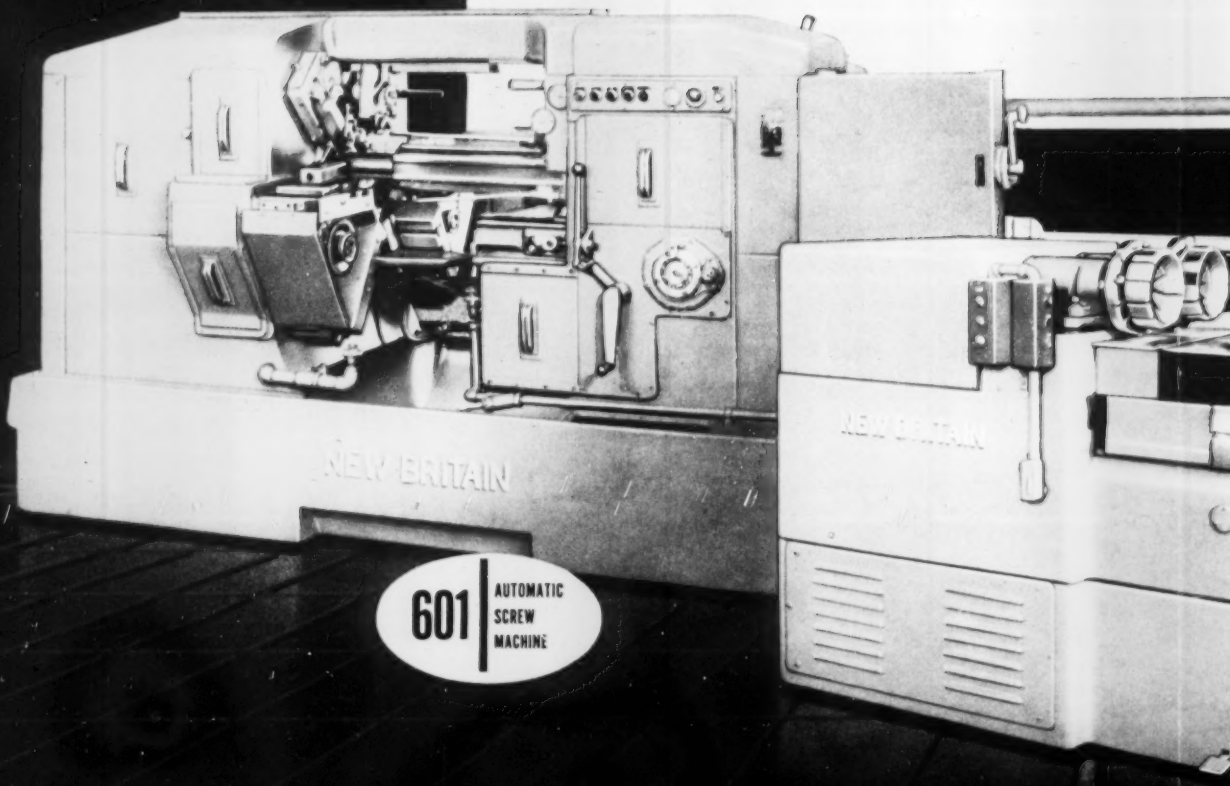
Machines for Making Progress

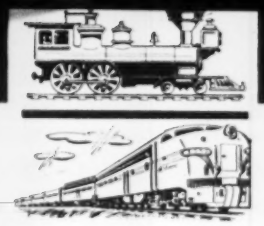
TODAY'S improvements in transportation make front page news. Behind every such advance is a similar improvement in the machines that turn out the products which go into each plane or train or motor car. Without better machines, progress would slow down to a walk.

On this page are three ultra modern machines vital to the plants where manufacturing history is being made. Are your machines this modern? If not, can you afford to do without the production speed and economy they make possible?

Model 601 Multiple Spindle Automatic Screw Machine is the most advanced tool for multiple operations on bar stock up to 1¼". This six-spindle machine is massive and powered for tough forming steel jobs. Designed for

AUTOMATIC BAR
LUCAS

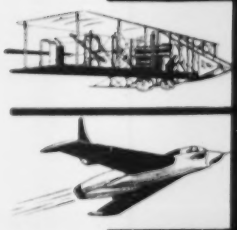




super-high spindle speeds essential for brass and aluminum. A cross slide in each position. Actuated by disc-type cams directly behind the slide. Exclusive features permit quick setups where short runs are the rule.

New Britain Precision Boring Machines include models for both straight or contour boring and turning. They are simple in design, and their cam controlled slides enable them to positively repeat from piece to piece, holding size to within .0001, with spindle speeds up to 7300 r.p.m. High production and great versatility are assured by such features as two-speed drive, rapid traverse, optional automatic loading device and optional vertical cross slide. Additional spindles may be mounted if the type and size of the job permits it. A double-end model is also available.

New Britain Model 126, a completely new approach to single spindle metal turning. Simple cross slide cams which can be preset have been specifically designed to reduce down time. Feed and speed changes automatically controlled from program drum. The Model 126 can be readily and quickly set up by the operator, and is adaptable to a variety of work jobs involving either long or short runs.

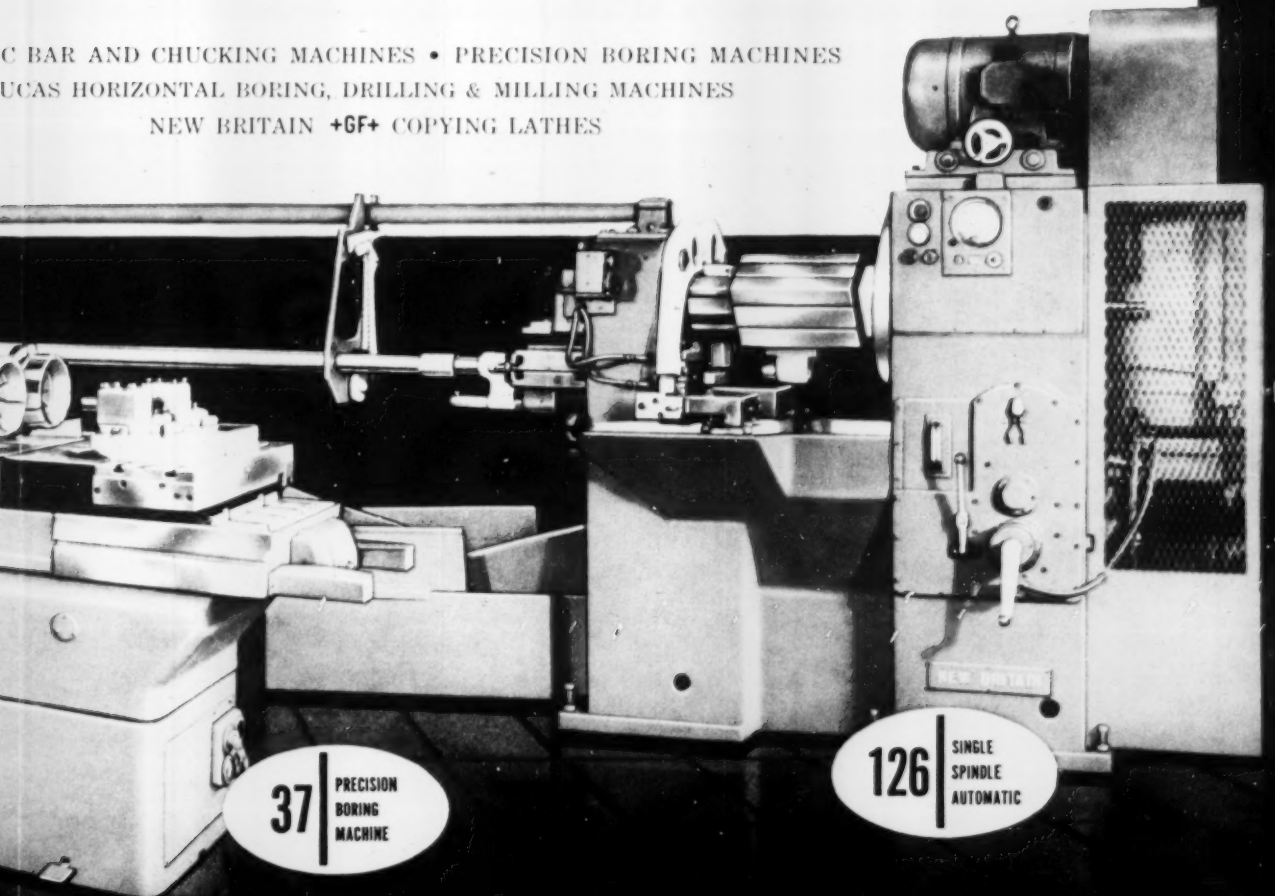


THE NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division
New Britain, Connecticut

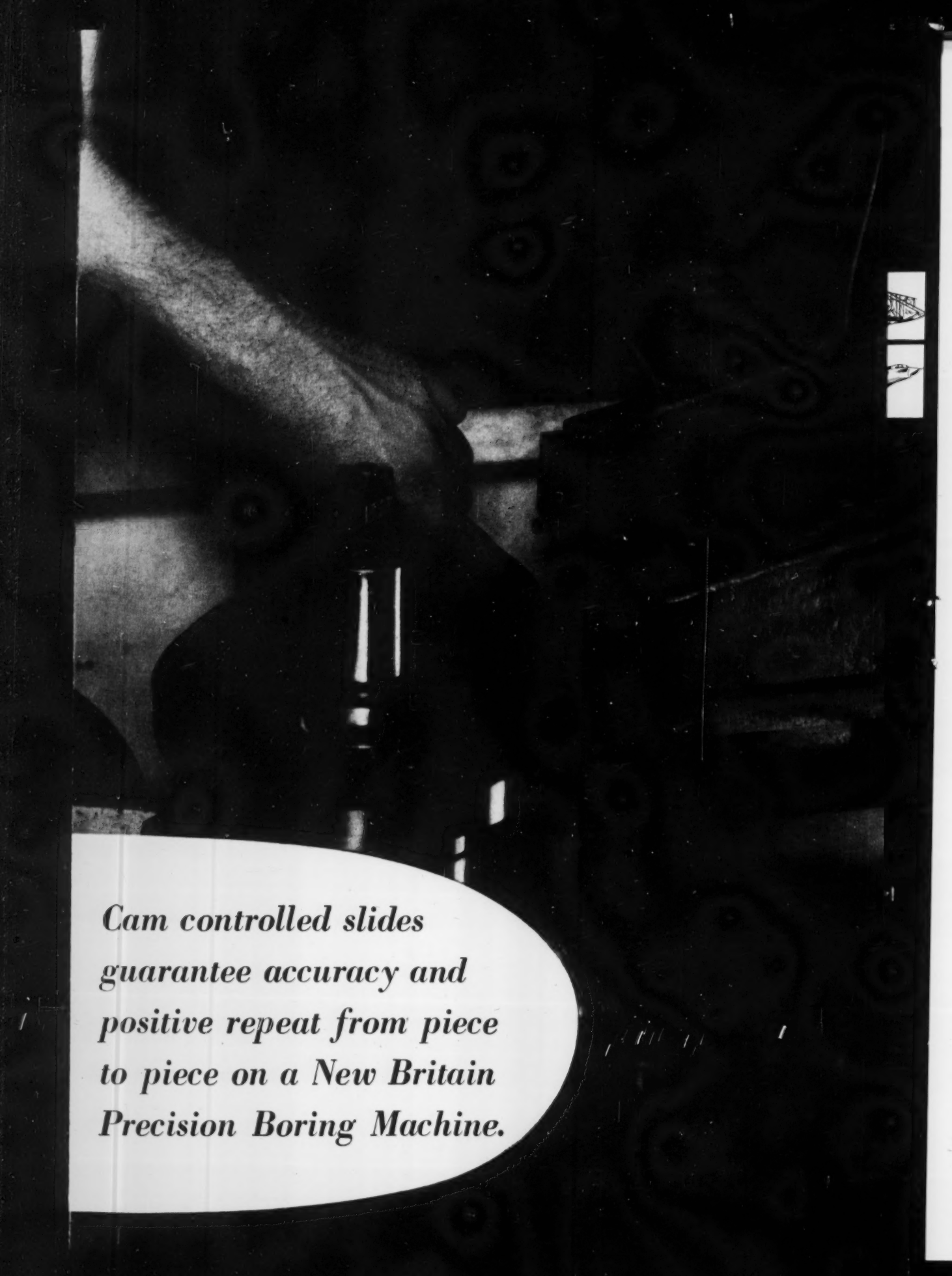
Lucas Machine Division
Cleveland 8, Ohio

C BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
UCAS HORIZONTAL BORING, DRILLING & MILLING MACHINES
NEW BRITAIN +GF+ COPYING LATHES



37 PRECISION BORING MACHINE

126 SINGLE SPINDLE AUTOMATIC



Cam controlled slides guarantee accuracy and positive repeat from piece to piece on a New Britain Precision Boring Machine.

STRETCH OUT YOUR STAINLESS, TOO

There *are* ways to stretch out your supply of stainless.

For example, you may be using a grade or finish of stainless that is in extreme demand when another similar one, not as tight, could do the job adequately.

Our metallurgical staff and stainless fabricating specialists are ready to help you look into this matter and to advise you on more readily-available types of stainless that will do a satisfactory job. Feel free to call on us for this specialized help.

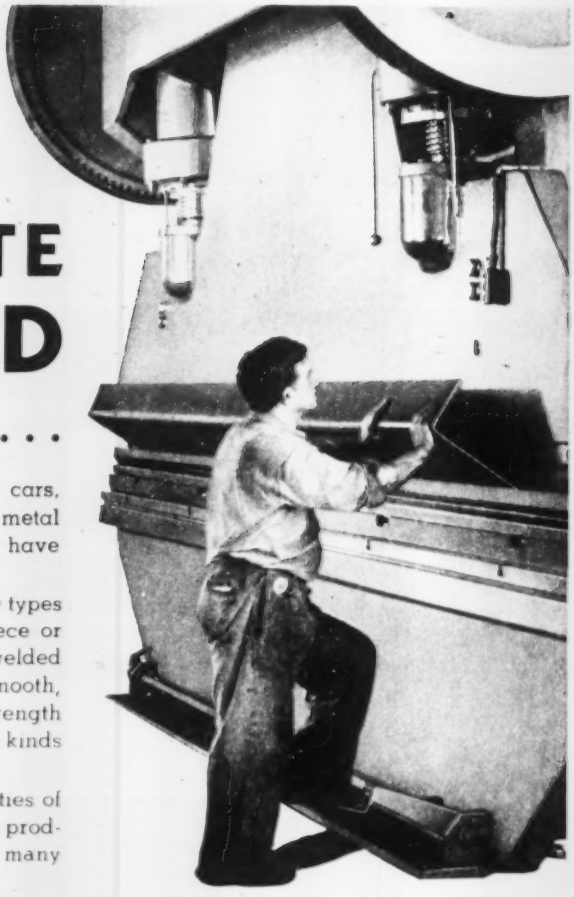
CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

STAINLESS STEEL

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REZISTAL STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



WHERE PLATE IS WELDED

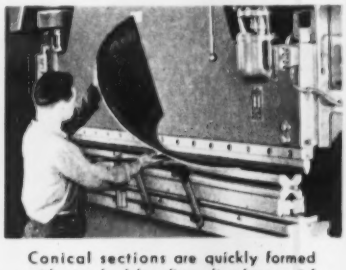
A STEELWELD IS NEEDED . . .

Whether you make boilers, furniture, railroad cars, ships, airplanes or machinery, if you work with metal from 12 gauge to one inch thick, most likely you have great need for a Steelweld Bending Press.

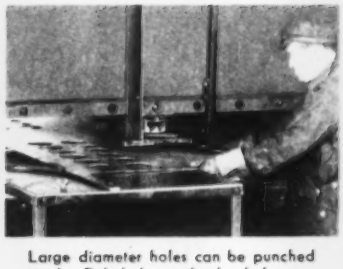
Steelwelds are versatile tools that perform many types of work quickly and easily, whether only one piece or a production run is required. Long, sharp welded corners can be replaced by quickly made, smooth, round, bended ones, and both appearance and strength improved. Illustrated below are some of the many kinds of work that can be performed on any Steelweld.

It will pay you to investigate the many possibilities of this modern metal-forming tool that is improving product appearance and saving time and money for many enthusiastic users.

Corrugating and any straight-line production bending can be done to hairline accuracy.



Conical sections are quickly formed with standard bending dies by use of the ram-tapering mechanism.



Large diameter holes can be punched singly. Bolt holes and other holes can be punched 25 to 150 at a time.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7827 East 281st Street, Wickliffe, Ohio

STEELWELD

BENDING PRESSES

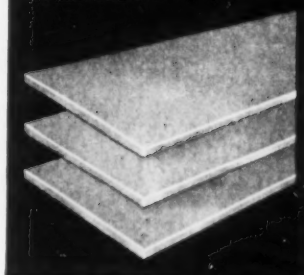
BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

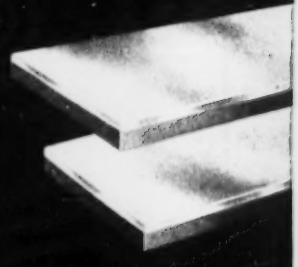
they're our specialties and we give them extra special care

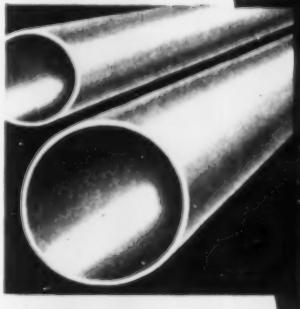
If your requirements call for any of the products shown here, you'll find it to your advantage to get in touch with us.

Each of these products is a specialty with us, which means that every order, large or small, receives our careful, individualized supervision—painstaking attention in every processing detail from start to finish.

We would welcome an opportunity to show you how our specialized facilities can supply you with steel and steel products that are tailored to meet your most exacting specifications. For additional information write to Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Del.







THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
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CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

Make Your Own Hose Lines

AEROQUIP HOSE AND FITTINGS ARE MATCHED FOR GUARANTEED PERFORMANCE

• No skill or special training is required to assemble Aeroquip Flexible Hose Lines by hand *in a matter of minutes!* YOU CUT COSTS because Aeroquip fittings are detachable and may be used again and again. YOU REDUCE INVENTORY because with Aeroquip bulk hose and a few fittings you can fill practically all your hose line requirements. YOU REDUCE DOWNTIME because with Aeroquip on hand, quick hose line replacements are available at all times.

Cut hose to length with hacksaw, screw into socket.

Oil nipple and inside of hose liberally.

Screw nipple into socket and hose.

Install fitting on other end; hose line is ready for use.

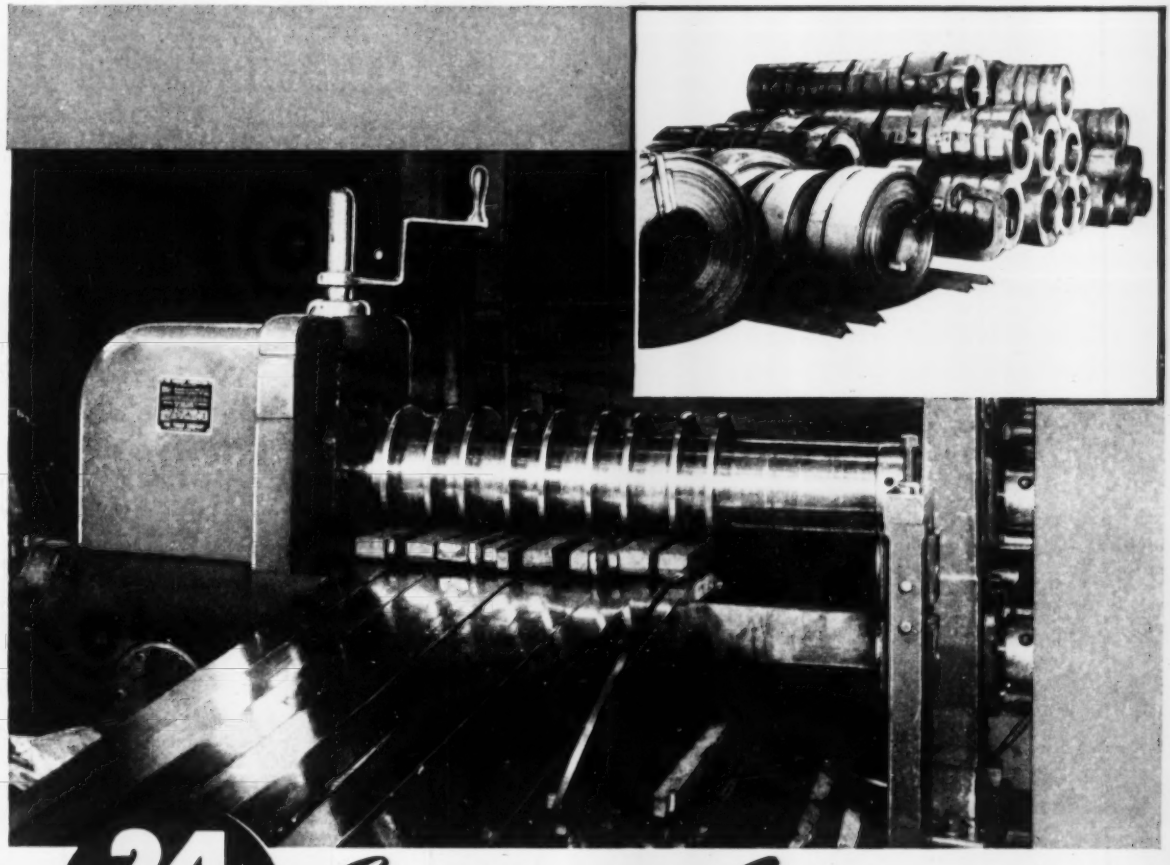
Aeroquip

REG. TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA. MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD



24 HOUR *Slitting Service!*

If you operate a slitter of your own, you may always enjoy this kind of service. Think what a blessing it is to be able to meet expected and unexpected needs for slit strands on such short notice—how greatly it simplifies production planning—how it eliminates production bottlenecks and minimizes strip inventories.

Then, too, when you buy strip in standard widths, your strip supply sources are more numerous. You buy wherever you get the best delivery, price, and quality.

Slitting service now may cost you anywhere from $10.00 to $100.00 or more per ton. Even if your needs were only 50 tons per month, at an average of $20.00 per ton for slitting, the cost per year would be $12,000.00—an amount which alone may be more than sufficient to make a Yoder slitter highly profitable.

The Yoder Slitter Book (sent on request) analyzes and discusses the economics as well as the mechanics of slitter operation. Yoder engineers will be glad to study your needs and submit recommendations as to kind, size, and cost of suitable slitting equipment.

THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio

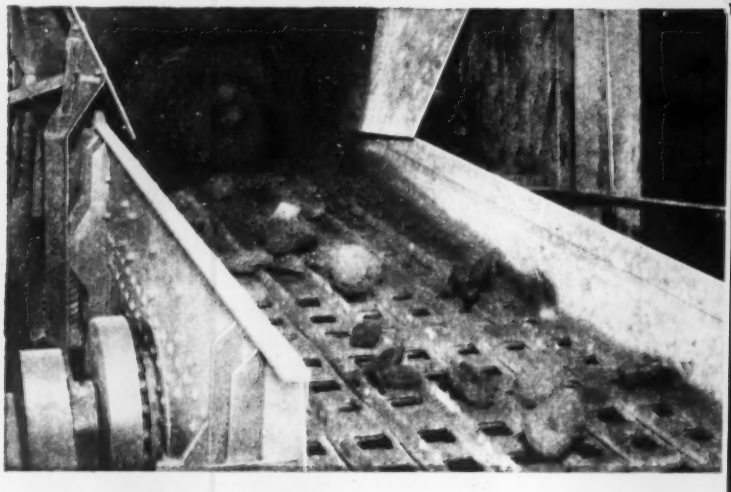
Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

Nearing

WORLD'S LARGEST CRUSHERS are two 3500-tph, 60-109 *Superior* gyratories being built for Mesabi's first commercial taconite plant. Ultimate plant output will be 10 million tons.



FINES ARE SCALPED from r.o.m. ore on sturdy 1000-tph vibrating screens like this one in Minnesota. A-C builds *six* separate types of vibrating screens for beneficiation.

EQUIPMENT FOR IRON ORE BENEFICIATION: Gyratory and jaw crushers . . . Vibrating screens . . . All types of washers . . . Concentrating jigs . . . Rod, ball, and *Ballpeb* mills . . . Centrifugal pumps . . . Rotary kilns and coolers . . . *Texrope* V-belt drives . . . All types and sizes of electric motors and generators . . . Starters . . . Transformers and voltage regulators . . . Complete power generation, distribution, control equipment.

the Bottom!

As Mesabi Ores Lean Out, Allis-Chalmers Aids in Beneficiation

DIRECT SHIPPING ORES are fading fast up on the once fabulous Mesabi range. But despite foreign ore discoveries, by 1955 a quarter of blast furnace feed must be beneficiated domestic ore.

Allis-Chalmers — manufacturer of equipment for the steel industry from the mine to the mill — is helping lead the way to more economical beneficiation of lean ores.

Does low ore content require you to triple material handled? Allis-Chalmers will build you bigger, more efficient equipment! At far left below is the world's largest crusher, being built by A-C for a Mesabi taconite plant.

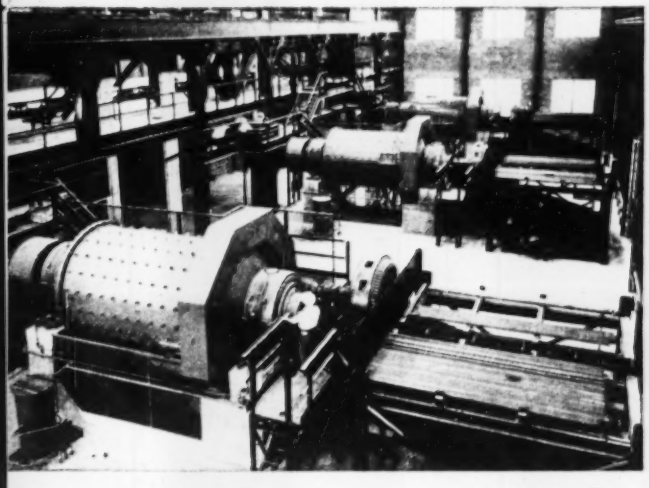
Has proper yet economical pelletizing got you stumped? Allis-Chalmers has just put into operation a pilot Pelletizing and Heat Hardening plant built exclusively for researching new pelletizing methods.

Do you have a beneficiation "shortcut" in mind? Don't let lack of equipment postpone your testing of new processes. The Allis-Chalmers Processing Research Laboratory stands ready to accurately and exhaustively test any processing method on a confidential basis.

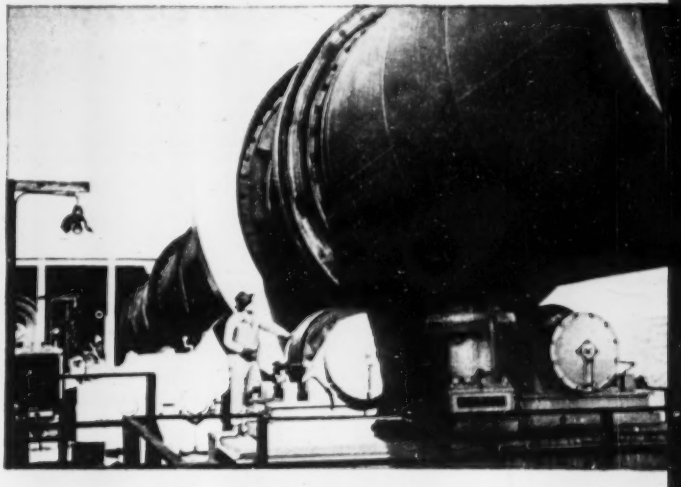
For over half a century Allis-Chalmers equipment has been processing ores for America's steel industry. Some of the cost-cutting, tonnage-increasing ore beneficiation equipment in the broad A-C line is seen on these pages.

Allis-Chalmers offers you *one-manufacturer responsibility* for process, drive and control equipment all along your flow sheet. For literature or detailed information on products and services, call your nearest A-C office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3808

Superior, Ballpeb and Texrope are Allis-Chalmers trademarks.



ORE IS GROUND in three rod and ball mills ahead of magnetic separation at this beneficiation plant. A-C builds *all* types of grinding mills for ore beneficiation processes.



IRON ORE IS AGGLOMERATED to make good blast furnace and open hearth feed in Allis-Chalmers rotary kilns in connection with iron mines and beneficiation plants.

ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Iron and Steel

3 MORE OFFICES

are serving U. S. founders and fabricators of **Alcan aluminum**

You know what's happening to the demand for aluminum. Up and *up* it's gone, yet this is still only the beginning. For aluminum—lightweight, nonrusting, strong, easy to fabricate—is proving its desirability in new uses every day.

To help meet your needs for this modern metal, our associate the Aluminum Company of Canada, Ltd., is constructing power and smelting facilities in Quebec for producing 130,000,000 more pounds . . . and facilities in British Columbia for producing 200,000,000 more pounds of aluminum per year.

For the convenience of our customers in important U.S. industrial areas, we have opened additional offices—in Cleveland, Chicago, and Los Angeles. Their addresses appear below.

ALUMINUM IMPORT CORPORATION

Distributing company of the **ALUMINIUM LIMITED** *group, in the Western Hemisphere*

Offices and agents in 40 cities — *Cable address:* ***ALIMPORT***

630 Fifth Avenue, New York 20 · 20 North Wacker Drive, Chicago 6 · 505 Terminal Tower, Cleveland 13
510 West Sixth St., Los Angeles 14 · Av. Ing. Luis A. Huergo 1279, Buenos Aires · Rua Da Quitanda 96, Sao Paulo

H. J.
Here's a really fantastic letter!
P.W.

BANNER TOOL COMPANY

BANNER Tools DETROIT — *Fine* TOOLS FOR INDUSTRY

17243 FILER AVENUE - TWINBROOK 2-4900

DETROIT 12, MICHIGAN

June 16, 1952

Cities Service Oil Co.,
3049 E. Grand Blvd.,
Detroit 2, Michigan
Attention: Mr. P. E. Watts

Dear Sirs:

We called upon the services of your lubrication engineer, Mr. A. J. Blake, in reference to a serious staining condition which we were having with our soluble oil. He analyzed this condition and recommended one of your Chillo Oils. This oil was tried and the rust condition eliminated to our satisfaction.

To our surprise on his next visit he was dissatisfied with our tool life and suggested we use a soluble oil called "Chillo A". Now not only do we have clean machines, but tool life has been increased 20%! While in our plant he asked permission to "look around", which, of course, was granted.

We were using a tapping compound with precision ground taps in order to hold to close tolerances. We did not consider tap breakage excessive but the removal of broken taps was sometimes rather expensive. He recommended we use "Chillo 10Z". Then came the surprise of our lives! With Chillo 10Z we have gone to commercial ground taps (a 300% savings) and can still hold our same tolerances, with a sharper thread, increasing tap life a minimum of 20% plus eliminating expensive removal of broken taps!

We also have a production stamping job which required a new set of dies every month. On his recommendation we tried Chillo 10Z with these dies. Now our die life has increased to at least two months...a saving in die life of 100%, disregarding labor costs. We also increased production 200% per die sharpening!

We tried the same oil on our broaching operation and found that instead of making two cuts we can get the same results now with one. We were using one of your competitors' hydraulic oils and you told us it was a "good oil" and would give us satisfactory performance. BUT, GENTLEMEN, WITH THE EXCELLENT SERVICE YOU HAVE GIVEN, PLUS THE TIME AND MONEY SAVED, YOU MAY REST ASSURED THAT ALL OF OUR LUBRICATING REQUIREMENTS WILL BE PURCHASED FROM YOU.

Yours very truly,

BANNER TOOL COMPANY

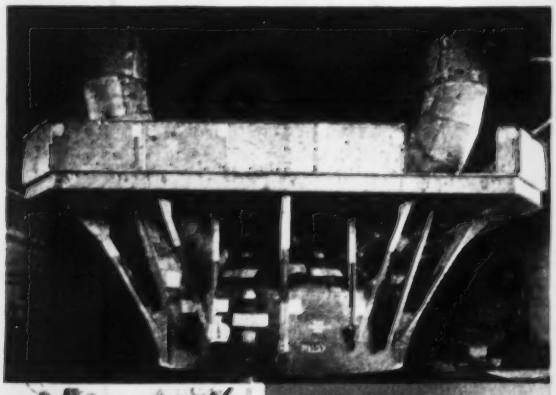
S. F. OLESAK

SFO:sd

Advertisement

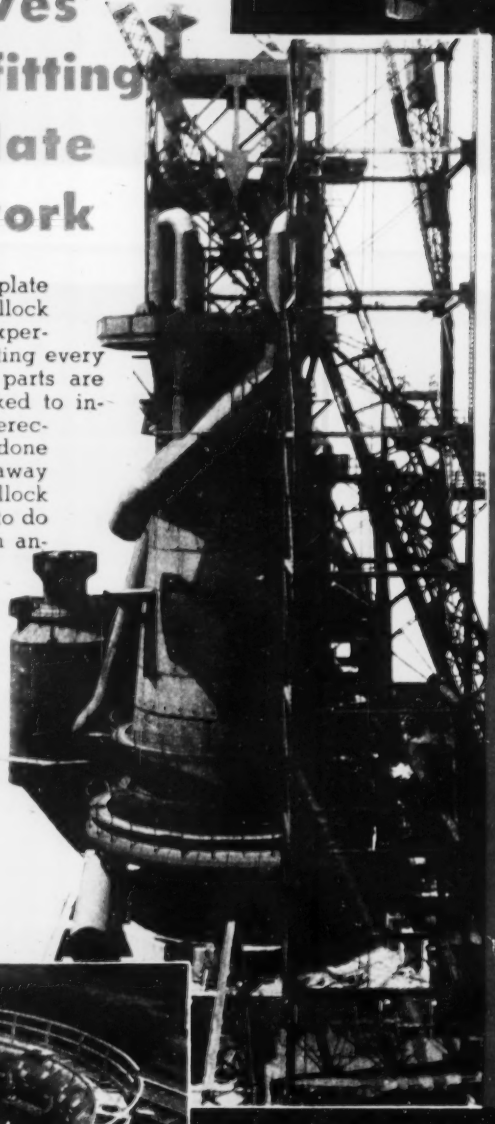
from
TOP
to
BOTTOM

POLLOCK gives you precision fitting in all steel plate construction work



Let Pollock handle your next steel plate fabrication and erection job, for Pollock skilled experts have had years of experience . . . can give you precision fitting every time! Before leaving the shop, all parts are assembled and carefully match-marked to insure close, accurate fits and speedy erection in the field. So carefully is this done that one customer — 12,000 miles away has ordered steel work from Pollock **three** times, and each time was able to do his assembling quickly and easily. In another instance, the Pollock Company tore down and rebuilt the steel work for an **entire** blast furnace which was out of operation only 83 days, setting a new world record and saving over 70,000 tons of pig iron.

You, too, can benefit from Pollock's broad experience . . . its complete facilities and well-trained engineering-designing staffs. Whatever your fabricating job — large or small — heavy or light — put it up to Pollock and see how you save!



Blast Furnaces

Hot Metal Cars and Ladles

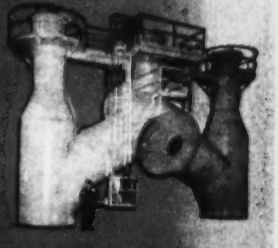
Ingot Mould Cars

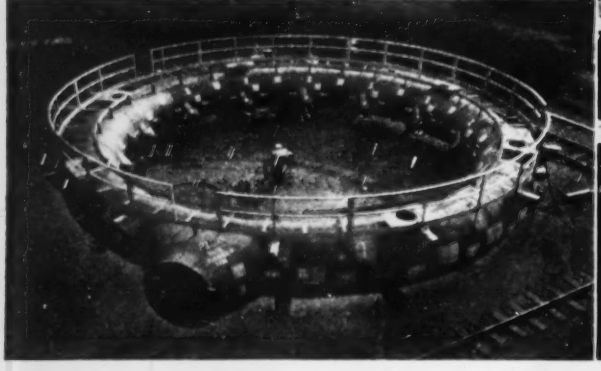
Cinder and Slag Cars

Charging Box Cars

Welded Open Hearth Ladles

Welded Steel Products





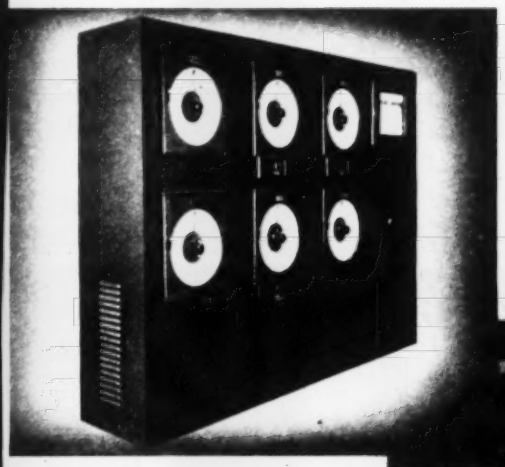
The WILLIAM B. POLLOCK CO.

YOUNGSTOWN, OHIO

•

STEEL PLATE CONSTRUCTION
ENGINEERS FABRICATORS ERECTORS

Job-engineered instrumentation by Honeywell assures performance ... saves time



APPLICATION ENGINEERING
starts with cooperative discussion between customer and Honeywell engineering representatives . . . follows through to design and assembly of complete control systems.

THERE'S more to instrumentation than instruments. Any control system, to do its job right, has to be designed for the methods, equipment, materials and of the process with which it works.

Here is where Honeywell Application Engineering steps in. First, a Honeywell engineering representative discusses process details with your engineers, production men and instrument technicians. Then he refers the problem to staff application engineers . . . each of whom is trained in the methods and control techniques for a specific industry.

These men work out details of what instrument to use for each measurement or control function . . . what type of primary element . . . what control system . . . what size and style of valve. Then they combine all these components into a complete system that is arranged for greatest production efficiency, convenience, and ease of service.

The new result to you is two-fold. First, this service saves you many valuable man-hours by supplementing the work of your own engineering staff. Second, you're assured of a control system that will give you the best in performance, not only of the Honeywell instruments, but also of the process which they serve.

Application engineering is one of the most important plus values you get from Honeywell instrumentation. Ask your local representative to discuss how it can go to work in your plant modernization or expansion . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4462 Wayne Avenue, Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

LINDE'S News of Metalworking

New Machine Carriage Saves Time On Many Jobs

A new machine carriage in the low-priced field does dozens of metalworking jobs—and does them more quickly, accurately, and uniformly than the most skilled hands. This machine, the OXWELD CM-45, handles practically all machine carriage requirements in small metalworking shops, and supplements heavier equipment in larger plants, shipyards, and mills.

Used on track, the CM-45 is ideal for accurate straight-line cutting. It also cuts top or bottom bevels at practically any angle. With standard radius rods, it cuts circles with diameters of from 2 to 54 inches. To cut larger circles, a longer radius rod can easily be substituted.

Flame-treating work—be it flame-hardening, flame-softening, or low-temperature stress relieving—requires precisely controlled heat. With the CM-45 and appropriate heating apparatus, you get just that, thus you can be sure that each of your flame-treating jobs will be done uniformly.

These are only a few of the jobs that the OXWELD CM-45 Machine Carriage will do for you. Many additional cutting, welding, and heating applications will be suggested by the requirements of your own shop.

The CM-45 saves you time, not only because it does each job efficiently, but also because it is so easy to set up and operate. There is no complicated machinery to master. Its simple design makes it easy to adjust or repair. All parts are readily accessible.

Operating controls consist of a speed-control dial that can be preset or adjusted at any time, and a two-position clutch lever. All controls are grouped together at the rear of the machine for your convenience.

Since the machine weighs only 33½ lb. complete with cutting blowpipe (as shown in Fig. 1), it's an easy, one-man job to move it from one section of your shop to another. The machine's compactness also makes it convenient for use in close quarters where larger machines cannot be used.

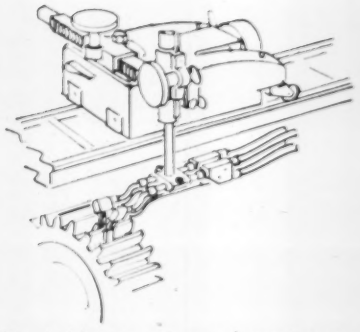


Fig. 2—Flame-treating work requires precise control of applied heat. The CM-45, with suitable apparatus, assures you of efficiency and uniformity on every job.

Any LINDE representative will gladly show you how the OXWELD CM-45 Machine Carriage will help you turn out more work in less time. Call the nearest LINDE office today for a free demonstration.

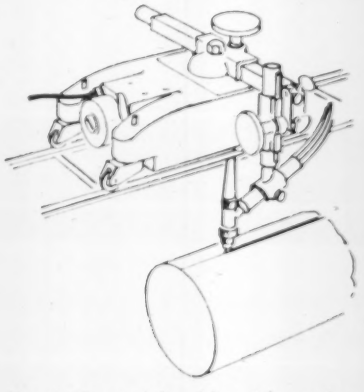


Fig. 3—Do special welding jobs, such as tube fabrication, quickly with the CM-45. Rejects are reduced to a minimum.

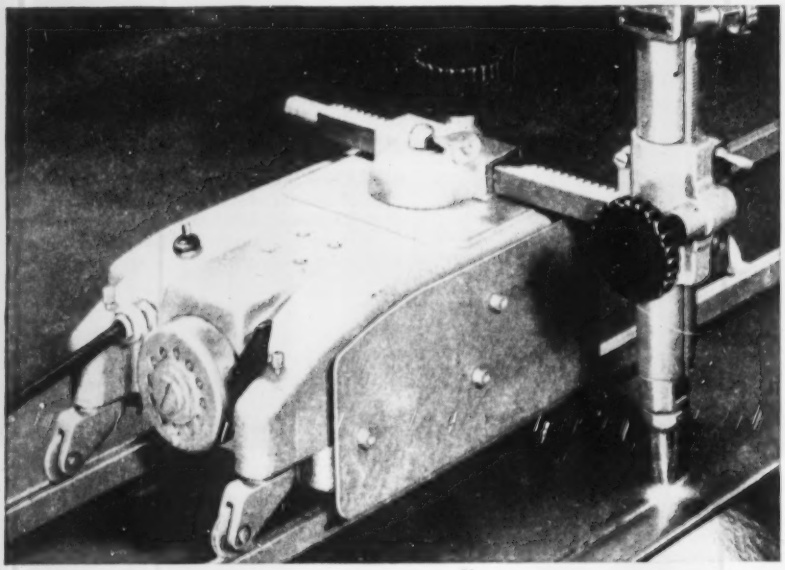


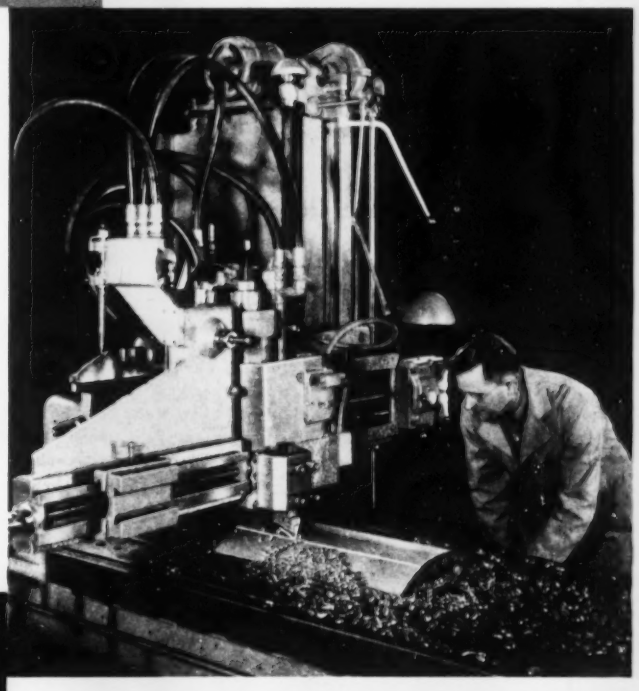
Fig. 1—Cut straight lines or bevels in plate or other steel forms. For all the CM-45's many jobs, a stepless speed range of 4 to 32 in. per min. is available.

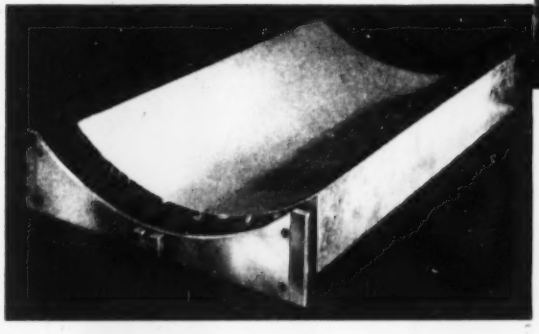
The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

use KOPY-KAT duplicating

TO
SIMPLIFY
FORM
MACHINING





Kopy-Kat duplicating is a fast, inexpensive way of reproducing identical forms. No expensive templates are needed. Forms are transferred direct.

For the L & W Tool & Manufacturing Co. at Milwaukee, Wisconsin, a Rockford Kopy-Kat machined a mold within limits of .002", using a simple flat stock template. They found the surface finish to be excellent, and the best obtained compared with any other method.

The entire machining time, including set-up for both work and template, was 39 hours floor-to-floor for both parts of the mold. The above illustration shows the convex part of the mold being machined. The concave part and the template are shown in the closeup view.

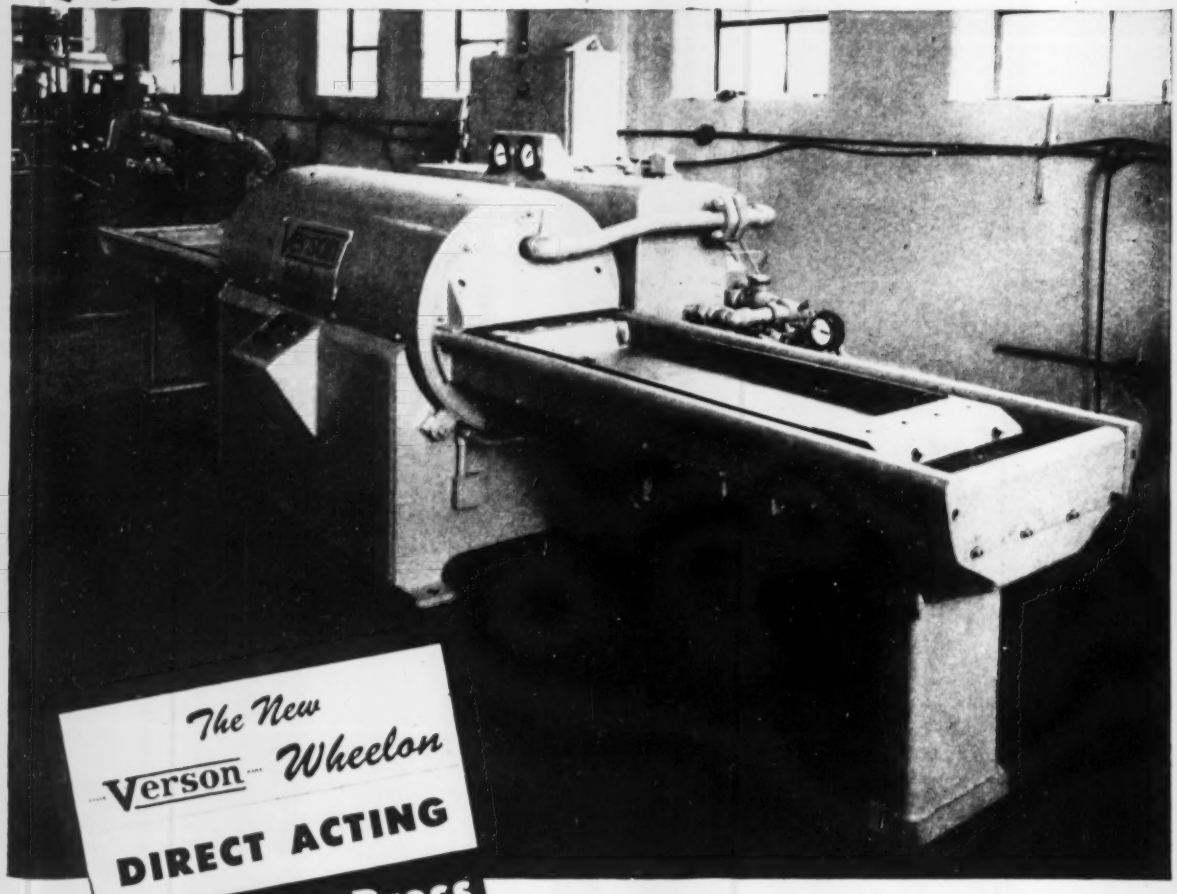
See the Kopy-Kat in action before selecting production duplicating equipment. A Rockford Machine Tool Co. representative will give you complete information.

Hy-Draulic

ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET ROCKFORD, ILLINOIS

YES— this is a 2500 ton press...

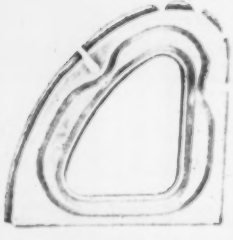


The New **Verson** *Wheelon*

DIRECT ACTING

Hydraulic Press

Formed in a conventional rubber pad press.



Formed in a Verson-Wheelon press.

To meet the demand for a more efficient, more economical method of rubber pad forming of metal, Verson now offers the Verson-Wheelon Direct Acting Hydraulic Press. With this revolutionary new method, it is possible to exert forming pressures many times as great as the practical maximum with a conventional rubber pad press. The small press above, for example, operates at 5000 psi, equivalent to a rated tonnage of 2500. The photos at the left show the superior forming detail.

The advantages of the Verson-Wheelon method are—complete forming of flanges, eliminating hand finishing . . . lower first cost . . . elimination of expensive machine foundations . . . minimum plant space requirements.

Write for bulletin VW-52 which gives further details.

A Verson Press for every job from 60 tons up.

Verson

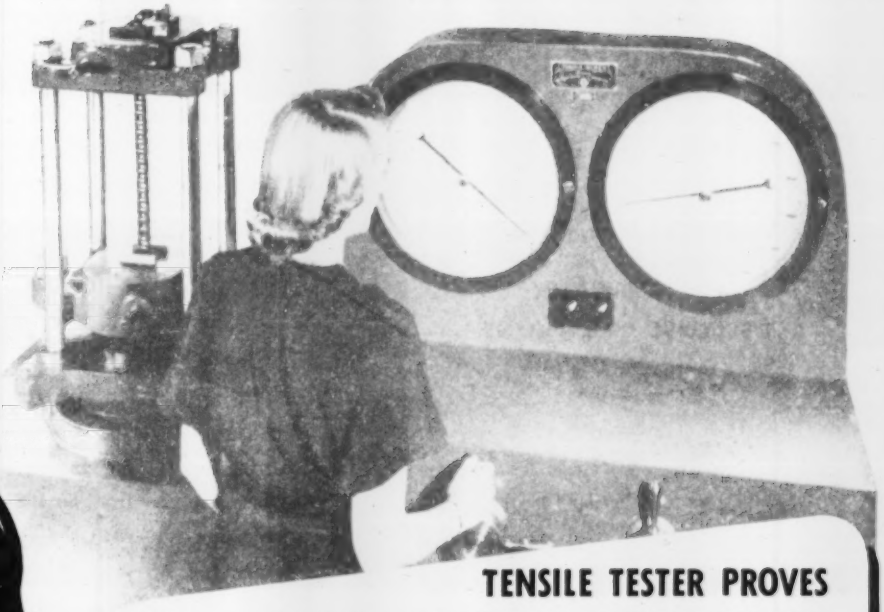
ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • SO. LAMAR AT LEDBETTER DRIVE, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

PRE-TESTED SUPER-STRENGTH FOR *Trouble-Free* PRODUCTION



TENSILE TESTER PROVES THE EXTRA LIFE IN ATLAS ROLLER CHAIN

Tortured and torn, in tests more rugged than any you would give it in normal use, Atlas Roller Chain gives daily proof on this Tensile Testing Machine of its super-strength. You know, before you buy it, that Atlas Chain has all the strength you'll ever need . . . to stand up and take it . . . year in and year out . . . under every operating condition.

The Tensile Tester is your guarantee that every Atlas Chain drive will deliver full rated horsepower. Result . . . your machine can run at full rated speeds, with consistently greater production and lower maintenance.

For maximum load-carrying ability and longer trouble-free life, install the chain with pre-tested strength.

Write today for the new Atlas Catalog and Handbook on roller chain. Atlas "Super-Life" Roller Chain is available through leading distributors everywhere.

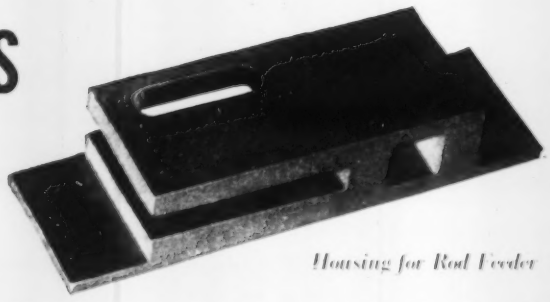
ATLAS CHAIN & MANUFACTURING CO.

PHILADELPHIA 24, PA.

ATLAS

ATLAS ROLLER CHAIN

These Intricate Parts are



Housing for Rod Feeder

ECONOMICALLY TO CLOSE DIMENSIONS

Internal Operating Lever

These two parts—vital to a starting-rod feeder for a hand-scarfing blowpipe—are produced in quantity by HAYNES precision-investment casting. Both parts are too intricate in shape for accurate production by conventional casting methods. And since they are made from stainless steel, the cost of machining the parts in quantity would be prohibitive.

HAYNES precision casting is an ideal method for mass-producing parts that must be made from an alloy difficult to fabricate into intricate shapes by ordinary methods. Sound, smooth castings are produced to such close dimensional standards that the need for finishing operations is minimized. For more information on the types of parts best suited to this process, and for tips on designing parts to be cast by this method, write for the booklet, "Investment Castings."

The efficiency of the starting-rod feeder on this hand-scarfing blowpipe is partly due to the use of HAYNES *investment castings for the critical parts of the assembly.*

HAYNES
TRADE MARK

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles—New York—San Francisco—Tulsa

"Haynes" is a trade-mark of Union Carbide and Carbon Corporation.

ENTHONE ENAMEL STRIPPERS

Custom Made to fill your particular needs . . .

If you have trouble finding the right stripper to remove the coating on your work, Enthone will be glad to select the right one from the many they make or will formulate a new one that will meet your requirements.

All you have to do is fill out a questionnaire which will be sent you on request, send this to us with typical samples of your work. Enthone Research Chemists will make the necessary tests and tell you how your problems can be solved. There is no charge for this service.

Enthone Research Chemists have developed over a score of strippers for organic finishes and are constantly seeking better methods.

Write for Enthone check list on over sixty products and processes for better electroplating and metal finishing.

METAL FINISHING PROCESSES

ENTHONE

ELECTROPLATING CHEMICALS

442 ELM STREET
NEW HAVEN, CONNECTICUT

If you want to get the True Picture of what Rotary Slitting Can Be . . .

then get SIMONDS

"Red Streak" Forged Rotary Shears

For shearing cold sheet or strip . . . separately or in gang-slitting operations . . . these "Red Streak" Rotary Shear Knives do the job *as nothing else can do it.*

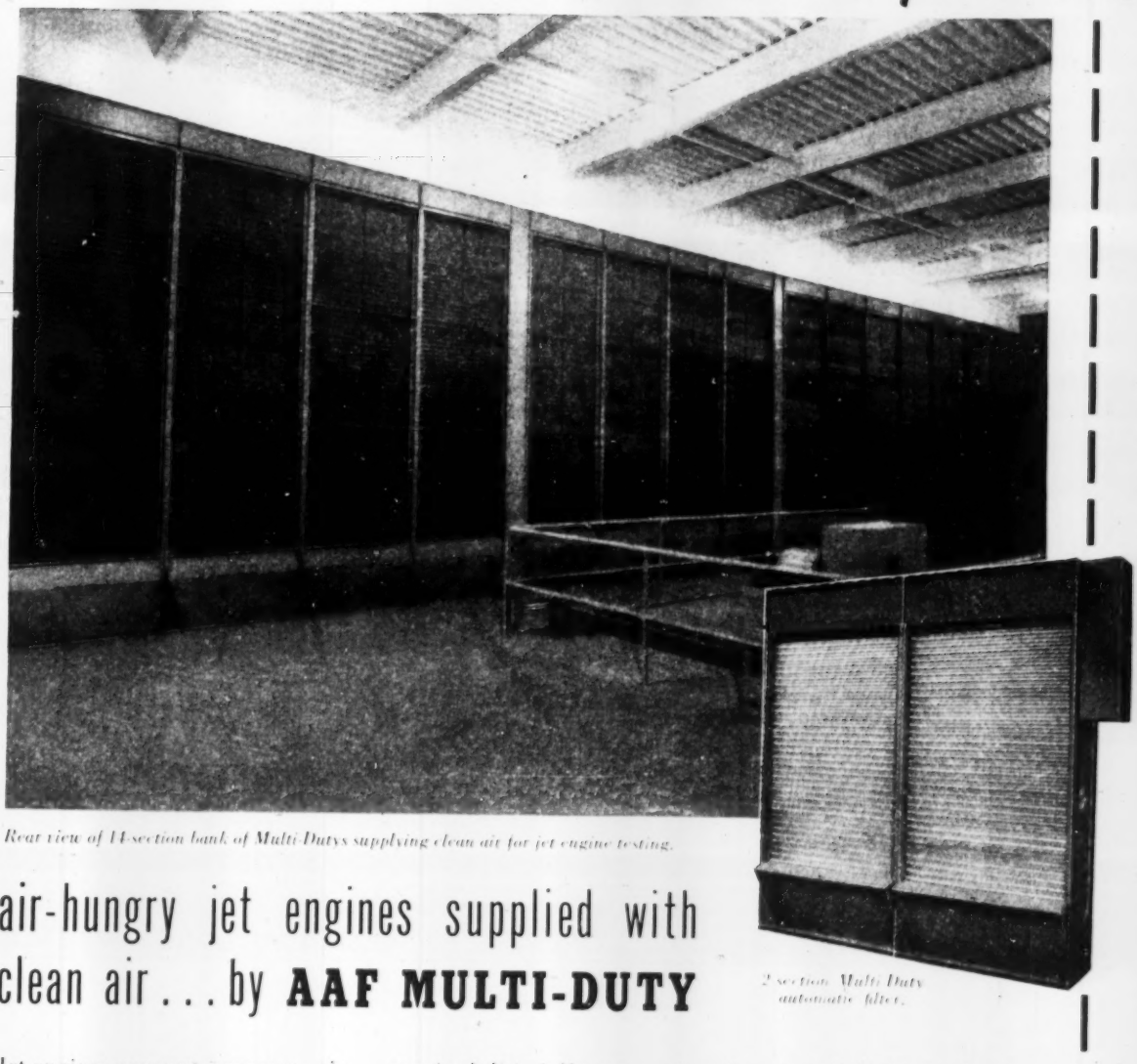
Forged from Simonds special Shear Steel . . . poured in Simonds' own steel mill . . . you can get "Red Streak" Shears in these 3 different alloys, each formulated for a specific application:

High-chrome steel, for shearing hot and cold rolled, tin plate and non-ferrous . . . *High-speed steel,* for hot and cold rolled . . . and *Special-alloy steel,* for hot and cold rolled and non-ferrous. Whatever your shearing job, Simonds has the knife that will stand up longer, cut cleaner, and at lower cost. Get in touch with your Industrial Supply Distributor *now.*

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

air as clean as you like it!



Rear view of 11-section bank of Multi-Duty® supplying clean air for jet engine testing.

air-hungry jet engines supplied with clean air . . . by **AAF MULTI-DUTY**

2-section Multi-Duty automatic filter.

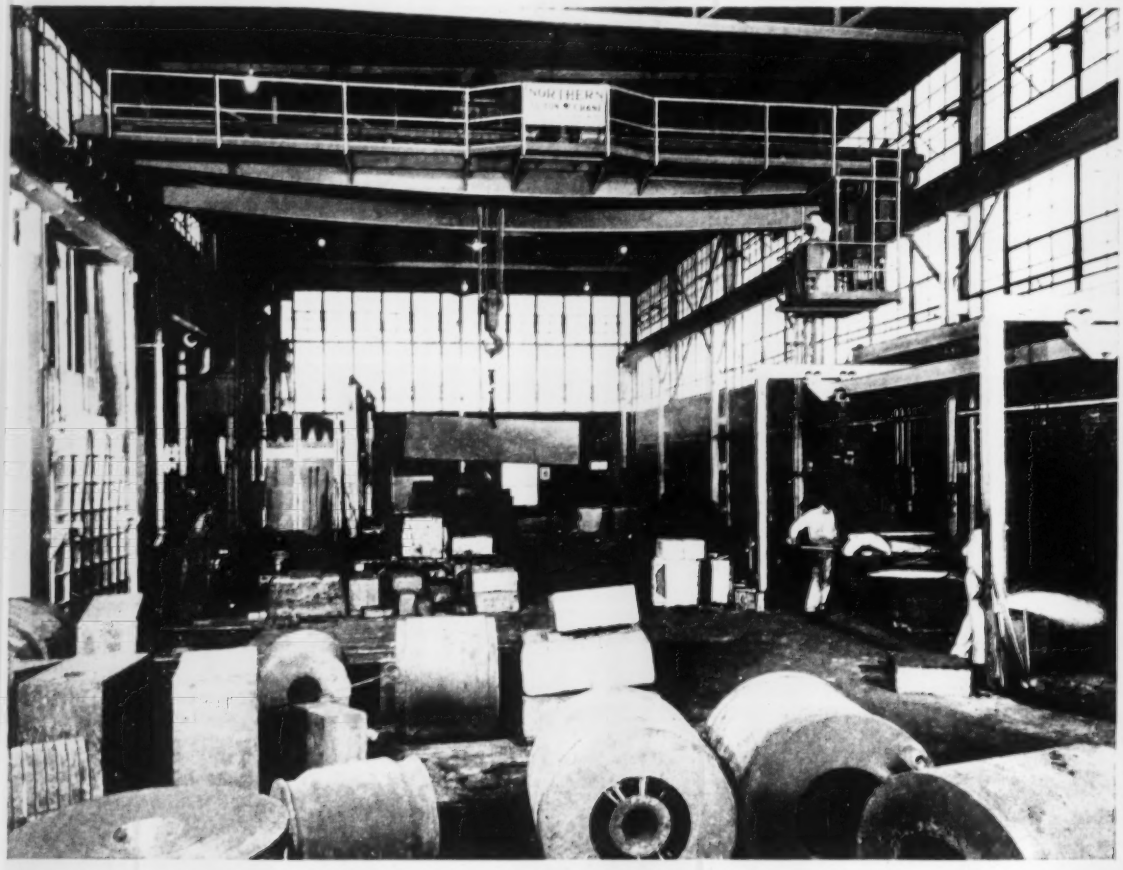
Jet engines consume enormous air volumes. In factory test areas this air must be *cleaned* to protect the impeller blades and air foil surfaces.

The 11-section installation of AAF Multi-Duty Air Filters shown here is one of a double bank supplying *clean air* to the test area of a large jet engine manufacturer. The Multi-Duty is an ideal filter for this type of application where constant clean air volume is required. It is fully automatic and self-cleaning . . . assuring maximum operating efficiency at all times without dependence upon the human element. Also the exclusive principle of overlapping panel construction in the Multi-Duty has never been surpassed as the most practical method of combining the function of self-cleaning with the operating cycle. This AAF filter is used in many industries and is available in any size or capacity.

You may not manufacture jet engines. However, if *clean air* for test operations or precision processes is one of your problems, call your nearby AAF representative. His solution will be based on AAF's complete line of engineered air filters and thirty years experience supplying *clean air* to industry. Write for Multi-Duty Engineering Bulletin No. 211A.

American Air Filter
COMPANY, INC.
443 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

AAF



A HE-MAN CRANE FOR A HE-MAN SHOP!

One machine tool primer defines a forge shop as "a place for a real he-man who can stand up and take it."

That overhead electric traveling crane—which must always be ready and able—must also have he-man ruggedness and dependability.

Moving swiftly back and forth—from furnace to forging press—this 25-ton NORTHERN CRANE swings hot billets, too hot and too heavy to handle in any other way.

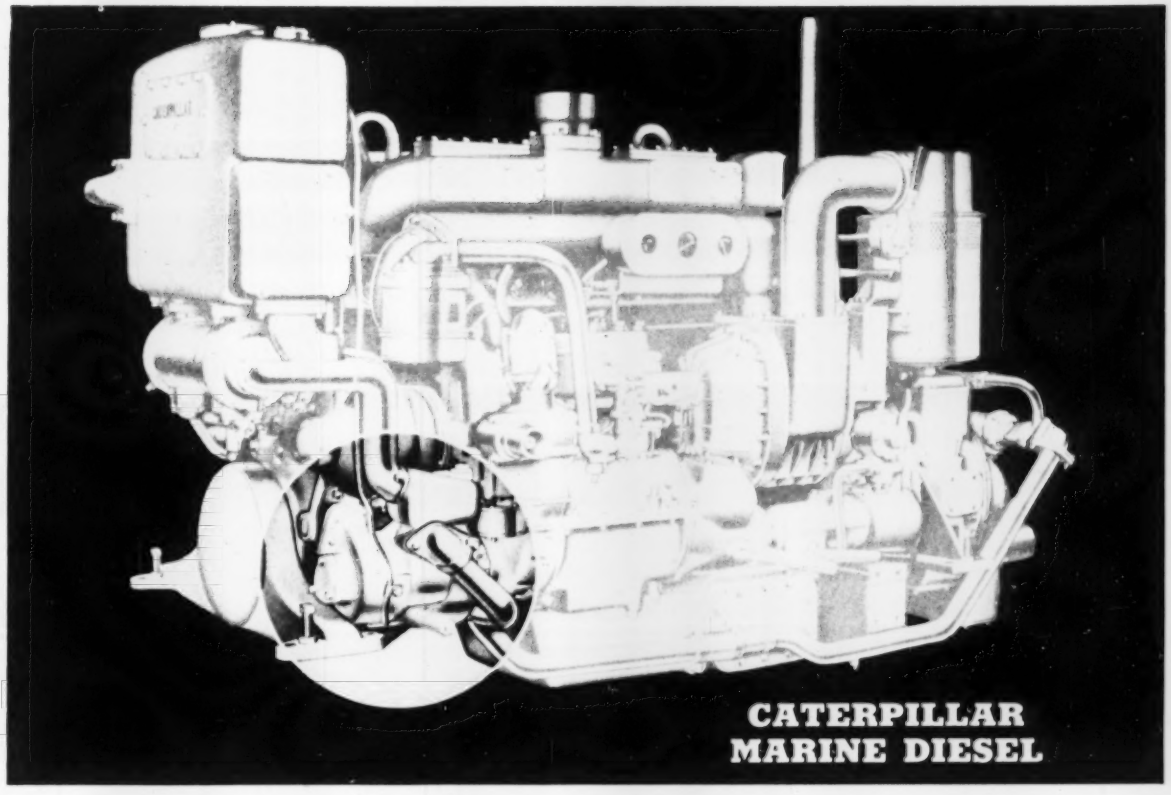
This is one of the many NORTHERN CRANES installed in the last 54 years to assure the most efficient production from machine tools and other machinery.

USE NORTHERN CRANES

NORTHERN ENGINEERING WORKS

2615 ATWATER STREET, DETROIT 7, MICHIGAN

BUILDERS OF CRANES AND HOISTS EXCLUSIVELY



National Bearing Castings Help Cool "Cat" Engines

National Bearing Division's foundry skill permitted a new design in pump efficiency and compactness.

This extremely compact 170 horsepower Marine Diesel Engine, with special coolant pump, is a new design in efficiency by Caterpillar Tractor Co., Peoria, Illinois, makers of famous "Caterpillar" Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

Unusual size restrictions were specified in the coolant pump housing. It had to be of tough, durable bronze, highly resistant to corrosion by raw sea water, and painstakingly cast as the housing component for a very compact coolant pump, capable of delivering 100 gallons per minute. The housing casting design was unusually intricate, with wall thicknesses exactly $\frac{1}{4}$" in some areas, $\frac{3}{32}$" in others. The mold for each casting required *14 cores*—all perfectly positioned, as the slightest misalignment would be ruinous. And, housings had to be cast to minimize machining.

"Caterpillar" selected National Bearing Division to provide these special bronze pump housings. We were chosen for proven ability to produce top quality castings, our unique core facilities, and our experience in applying over 50 years of specialization to customers' problems.

Our bronze pump housing castings met—and continue to meet — "Caterpillar's" specifications for quality, tolerance, and minimum machining in every respect.

If your product includes copper, bronze, or other copper-base castings, it will be worth your while to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

Write to National Bearing Division for complete information and your copy of our catalog.

Brake Shoe

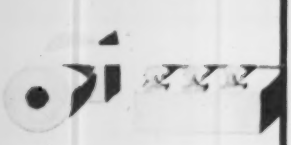
NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

problem...

..HOW TO CUT STEEL COSTS



Both systems begin with mill coil. However, if you are now buying sheet you are faced with the following costs.

For mill cutting to random lengths, simply shearing to reach sheet form, add **$.10** per hundred weight to basic steel cost.

For squaring to tolerance at the mill add another **10 percent** to your basic steel costs.

Then for wrapping and palletizing to keep the sheet clean and easy to warehouse **add an additional $.025** to the costs.

The steel, of course, must be delivered regardless of form.

solution...

..A WEAN SLITTING and SHEARING

With the Wean system you buy coils, simply prepared . . . eliminate mill extras. Delivery is of comparatively few width sizes.

The fewer sizes . . . the smaller purchasing and inventory staffs required.

And you save approximately 30 percent in storage area.

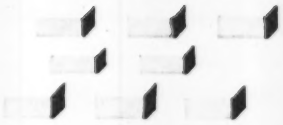
The Wean Line converts the coil of steel to resquared multiples at rates up to 200 feet (or 100 cuts) per minute. Tolerance control is easily held within accepted

Actual Savings in Steel Costs of 20%

To many steel fabricating people this amazing speed of cutting-to-length to resquared tolerances has seemed unbelievable. But, to many others, who have seen one of these Wean lines in operation, talked with people who operate them, gone over actual figures, this is a production line "must".

When we say savings up to 20 percent in your steel costs we mean just that. Total up the costs approximated above . . . check them against the book . . . against your own cost sheets. Find out what you're paying for getting steel from coil to final sheet size, ready to form. If it's more than a dime a hundred weight then you should know all about the Wean line. Get in touch with one of the offices listed below and let a qualified Wean representative work with you — using your figures if you wish — in proving the Wean line can effect a substantial savings where you and your operations are concerned.

Where you're buying sheets of various sizes you'll require about **30 percent more help** in your purchasing and inventory control departments.

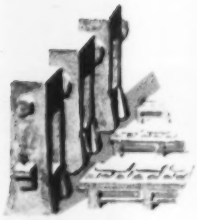


And about **30 percent more space** in your warehousing set-up.

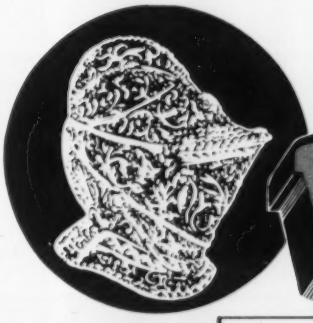
Then, if you further resquare to multiples in your own plant you're paying **an additional cost of at least $.35 per hundred weight.**

Thus, prior to fabrication, you have added approximately $1.00 to every hundred pounds of steel, even though you are using plain light gauge metal.

LINE



range. *The entire "extra" cost prior to fabrication here . . . just a fraction of the $1.00 plus per hundred weight cost of standard methods.*



Wean

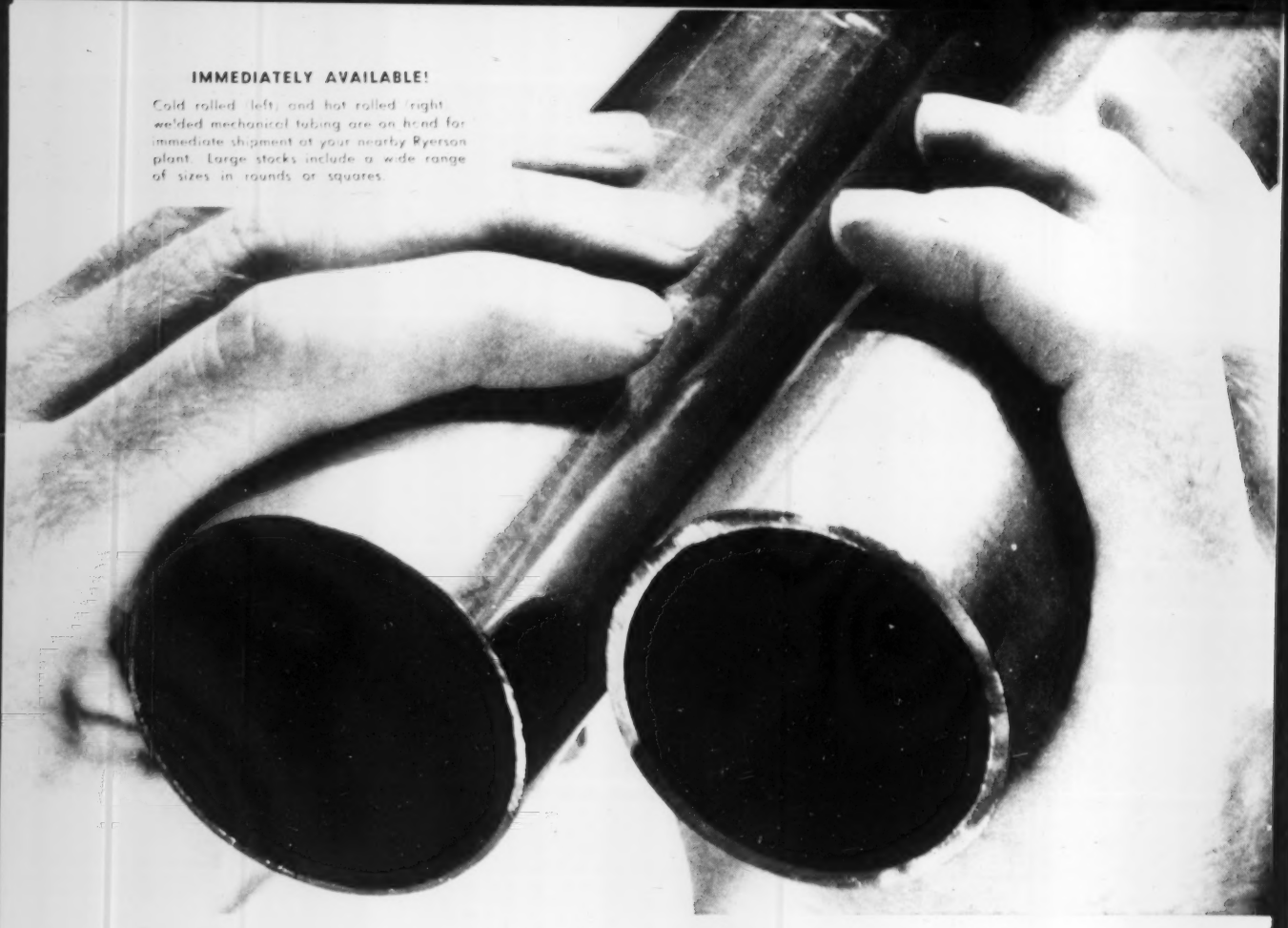
COMBINATION SLITTING and SHEARING SYSTEMS

WEAN EQUIPMENT CORPORATION OFFICES

CLEVELAND

CHICAGO NEWARK, N. J. DETROIT

Cable Address: WEANCOR



IMMEDIATELY AVAILABLE!

Cold rolled (left) and hot rolled (right) welded mechanical tubing are on hand for immediate shipment at your nearby Ryerson plant. Large stocks include a wide range of sizes in rounds or squares.

Doubled-Barreled Solution to Many Tubing Problems

Two good answers to many of the problems facing tubing users today may be found in the use of welded mechanical tubing, hot or cold rolled. With supplies of seamless tubing currently limited, except in small sizes, welded tubes are finding wider acceptance as an entirely satisfactory alternate.

Both hot and cold rolled welded mechanical tubing are on hand today at your nearby Ryerson plant. You can get quick shipment on either one in a wide range of round and square sizes. And you can be sure that the tubing you buy from Ryerson is of uniform high quality.

For example, the hot rolled has an unusually bright finish for this type of tubing because the strip from which it is made has been pickled. This gives a surface that takes paint well without any preparation.

Ryerson tubing specialists will gladly work with you on any tubing problem. So call us for welded tubing, now in good supply, as well as for other tubing requirements.

PRINCIPAL PRODUCTS

CARBON STEEL BARS— Hot rolled and cold finished.

TURING— Seamless and welded mechanical and boiler tubes.

STRUCTURALS— Channels, angles, beams, etc.

ALLOYS— Hot rolled, cold finished, heat treated.

PLATES— Many types including Inland 4-Way Safety Plate.

STAINLESS— Allegheny... bars, plates, sheets, tubes, etc.

SHEETS— Hot and cold rolled, many types and coatings.

MACHINERY & TOOLS— For metal fabrication.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL

The Metalworking Outlook

March 2, 1953

Time Is Running Out

Steel companies want to know now what kind of distribution controls will be in effect after June 30. That's because they require as much as 120 days' lead time on a few products, so the deadline for placing some third-quarter orders is coming up now. There will be a "Little CMP" for the military and atomic energy programs, and steel companies will probably honor advance orders for those even though details about Little CMP are still vague. The unanswered question, though, is what to do about the advance third-quarter orders now coming in from nonmilitary customers.

Good Civilian Business?

Fluctuations in business activity in the period ahead will depend primarily on the development of private markets (p. 57). That's what M. Joseph Meehan, director of the Commerce department's Office of Business Economics, told the American Management Association. He thinks good civilian business will be possible because new plant and equipment expenditures, according to his office's preliminary studies, will remain high in 1953, not far from the $27.3 billion level reached in 1952. Companies plan capital outlays in 1954 and 1955 of 85 per cent and 80 per cent, respectively, of their 1952 volume.

Construction: Better Than Ever

The nation's construction industry now may even surpass the record $33 billion volume expected for it in 1953. The winter has been unusually mild, and projects for the year have had a fast start. The removal of most controls over construction encouraged contractors.

Emphasis on Depreciation Reform

Even more equipment will be purchased in the next few years than now expected if depreciation tax laws are reformed. That's the opinion of Machinery & Allied Products Institute which is renewing its campaign for a new look at that aspect of our tax laws. It suggests: Restoring a wider area of discretion to business management in the determination of service lives; returning to the Bureau of Internal Revenue, where it was originally, the burden of proof that depreciation deductions are excessive; and permission to write off the cost of equipment over two-thirds of estimated service life.

Cool Prospects

One civilian market that's certain to boom in 1953 is room air conditioning. The industry expects to sell 650,000 room coolers this year and eventually to market 2 million units annually. Fewer than 0.5 per cent of the more than 40 million homes in the U.S. have any cooling equipment. Even the traditionally conservative General Electric Co. says, "The market is ready to burst wide open."

Watch Marketing Efficiency

If you want to take full advantage of new civilian markets, watch your marketing efficiency. Since 1940 this country has about doubled

Production Engineering News p. 85 The Market Outlook p. 153

its physical capacity to produce goods. Yet during that same period, it has not doubled its capacity to sell them. The number of salesmen has increased only 28 per cent.

Still Some Conversion

Steel supplies are steadily improving, but there's still a long way to go. For example, Pittsburgh Steel Co. has sold ingots for conversion purposes well into the third quarter of this year. Pittsburgh President Avery C. Adams points out that if leading consumers were not confident that there would be a stringency for some months to come, they would not be committing themselves that far ahead on expensive conversion.

Peak Altitude for Aircraft

Within the next ten months, the U.S. aircraft industry is scheduled to reach its peak production and employment. By this year's end, some 800,000 will be directly engaged in building aircraft, compared with 1,250,000 in 1943 when employment soared under the impetus of allout wartime requirements. Although employment this year will be 450,000 less than a decade ago, the annual payroll of the industry will hit a record $3.3 billion in 1953. Since half of the industry's total sales dollar goes into payrolls, you can see why wages constitute a major factor in the higher cost of today's military aircraft.

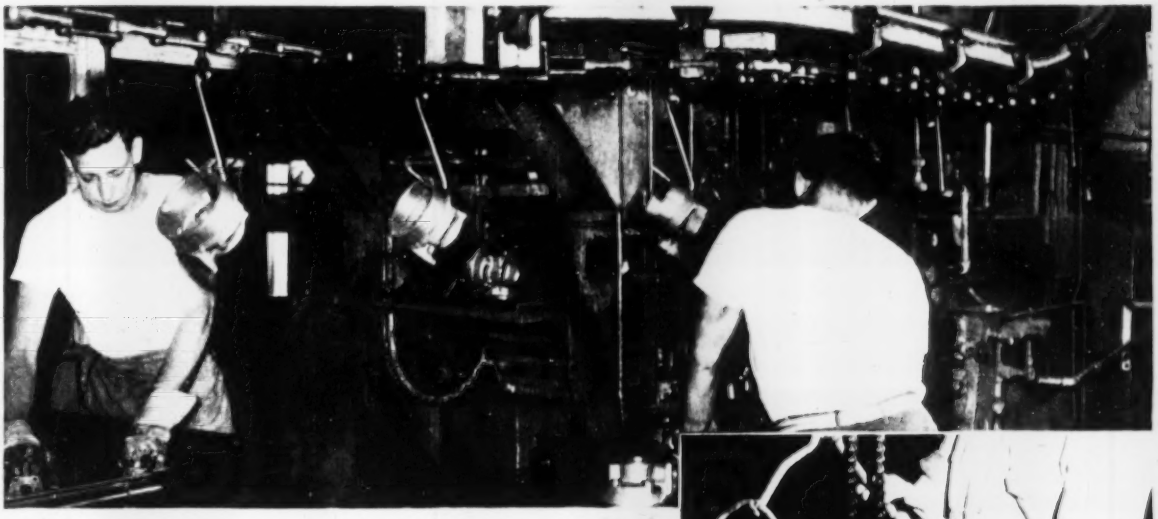
Straws in the Wind

January machine tool shipments were 361.9 per cent of the 1945-1947 average, says National Machine Tool Builders' Association; that's the highest shipment rate since last September; new orders for the month were also the highest since last September . . . Youngstown Sheet & Tube Co. last week lit a new Indiana Harbor, Ind., blast furnace which has a daily capacity of 1600 tons . . . Steel Co. of Canada Ltd. will spend $15 million in 1953 on expansion.

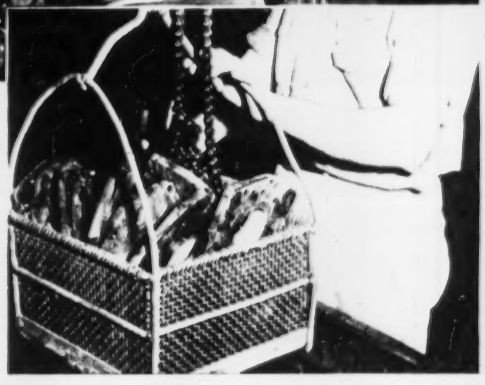
What Industry Is Doing

Industrial expansion for defense has declined since the second quarter of 1952 (p. 58) . . . The Commerce department sums up industrial accomplishments in 1952 (p. 58) . . . Congress will probably make only minor changes in the Taft-Hartley Act (p. 59) . . . What sort of person is the average company director? American Institute of Management surveys 2000 board members (p. 60) . . . Lorain Slag Co., Lorain, O., takes long strides to counteract annoying sulphur odors (p. 60) . . . Inland Steel Co. will spend $50 million to develop iron ore bodies in Steel Rock lake, northwestern Ontario (p. 61) . . . Price ceilings go off copper and aluminum (p. 63) . . . Sales of reinforced plastics are growing about 40 per cent each year (p. 68) . . . Makers of builders hardware in 1953 are hoping to equal last year's sales of $220 million as construction remains heavy (p. 69).

THE SOLVENT DESIGNED FOR MODERN VAPOR DEGREASING



CONVEYORIZED. "Triclene" D cleans refrigerator motor parts speedily and economically on a production line basis.



MANUALLY OPERATED. Castings will emerge clean, warm and dry from this small basket degreaser—instantly ready for assembly or further fabrication.

DU PONT
"TRICLENE" D
(TRICHLORETHYLENE)

speeds conveyor and manual operations

You can't buy a better solvent for modern vapor degreasing than "Triclene" D. Whatever your present degreasing requirements are, rugged "Triclene" D assures you perfect solvent performance. That's because "Triclene" D has been carefully developed over the past twenty years—ever since Du Pont pioneered synthetic solvents for vapor degreasing—and is specifically designed to meet today's varied cleaning tasks.

Stable and pure "Triclene" D gives excellent results in high-speed degreasing operations—even those involving removal of the newer, chemically active lubricants. Its narrow boiling range permits easy solvent recovery from sludge for efficient re-use. And to help keep your *entire* metal cleaning operation at peak efficiency, Du Pont field men will gladly give you the benefit of their technical experience.

THIS VALUABLE INFORMATION IS YOURS—FREE

You'll find complete information on the operation and maintenance of vapor degreasing equipment in these booklets. And interesting, up-to-date case histories about degreasing units in operation throughout the metal field are presented in our publication, "MODERN METAL FINISHING." You can receive this wealth of information by checking the appropriate boxes in the coupon below and returning it to us.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Del.

Please send me more information on vapor degreasing and "Triclene" D. I am interested in receiving the literature checked below.

- ☐ Free booklets on vapor degreasing
- ☐ Free publication "MODERN METAL FINISHING"
- ☐ (Please add my name to the mailing list)

*Name*_____ *Position*_____

*Firm*_____

*Address*_____

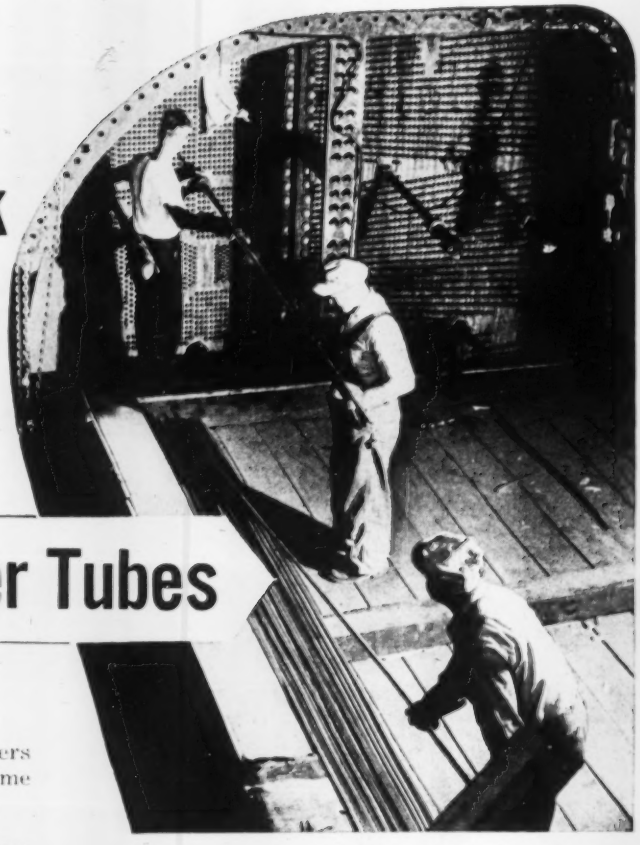
*City*_____ *State*_____

DU PONT
first in solvents for
VAPOR DEGREASING

DU PONT

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

One Way to Lick Corrosion and Wear of Heat Exchanger Tubes



Anaconda 70-30 Cupro-Nickel Tubes, produced by AMERICAN BRASS COMPANY, Waterbury, Conn., were used to replace tubing of Admiralty Metal at the Harbor Steam Plant, Dept. of Water and Power, City of Los Angeles, Calif. View shows men retubing part of a 70,000 sq. ft. surface twin-condenser with 5,878 Anaconda cupro-nickel tubes ⅞" O.D. x 26' 3" long, serving a 75,000 KW turbine.

It takes a lot of handling to retube heat exchangers . . . and while the job goes on, equipment downtime plays mischief with production.

Minimize the risk of such shutdowns. Wherever heat-transfer capacity is a factor, especially where wall thickness of tubes allows but little tolerance for effects of corrosion and erosion, specify 70-30 cupro-nickel tubes.

Thin walls of this strong tough alloy resist corrosive and erosive attacks from all sorts of cooling media including polluted, silt-laden harbor water.

Along with ability to withstand a wide variety of corrosive agents, the 70-30 cupro-nickel tubing provides outstanding resistance to pitting and stress corrosion cracking.

* * *

Aship or ashore, this alloy gives unsurpassed performance in vital parts of equipment exposed to salt water corrosion.

In power generator stations, sugar mills, oil refineries and similar plants . . . cupro-nickel alloys serve in feed water heaters, condensers, evaporators and other heat exchangers, and in oil coolers, stills, water boxes, piping, tanks, and other equipment. Cupro-nickel alloys minimize maintenance and replacement expense, loss of heat transfer capacity and interruptions of operation resulting from corrosion.

Cupro-nickel is produced in tubing, rod, strip, wire and sheet, and also in cast form. We shall be glad to give you additional information and help you select the one best suited to your requirements. Write us today.

At the present time, nickel is available for the production of cupro-nickel and other alloys containing nickel, for end uses in defense and defense supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Legislation by Treaty

One wonders how many American citizens realize what has been going on in the International Labor Organization, of which the United States is one of 60 member nations. ILO was formed under the auspices of the League of Nations, continued in existence after the league was abandoned and now is an agency of the United Nations. It has a permanent office in Geneva, Switzerland, which is well staffed.

In its early years, ILO devoted its activities to matters pertaining to labor, but recently it has strayed far afield from its original objectives. Today it seems disposed to tackle anything that will promote state socialism in its member countries. William L. McGrath, president of the Williamson Heater Co. of Cincinnati, adviser to Charles P. McCormick, employer delegate on the United States delegation of ILO, is performing a patriotic service in attempting to arouse his countrymen to the dangers that lie in ILO.

In his report of the 35th conference of ILO held last June and in numerous addresses throughout the country, he points out that the two United States government delegates "in all but a few cases, vote for socialistic proposals which are contrary to the principles and philosophy of the United States." Usually the United States labor delegate votes for socialism and the United States employer delegate votes against it. This three-out-of-four pattern applies to most of the member countries.

If ILO adopts a "convention," it can be ratified by the United States Senate by a two-thirds vote of senators present. If it receives this vote, it becomes law, taking precedence over existing domestic laws without submission to the House of Representatives and without action by the people.

Senator John W. Bricker of Ohio has been alert to the danger of "legislation by treaty" and has introduced S. J. Resolution 130 providing for a constitutional amendment forbidding the ratification of a treaty the terms of which are contrary to the constitution of the United States.

Obviously this alarming situation calls for immediate action. First, the Eisenhower administration should appoint two ILO delegates who believe in our form of government. Secondly, the Senate should adopt Resolution 130.

E. C. Shaner

EDITOR-IN-CHIEF

YOUR ROLE IN ATOMICS: Many executives who have been wondering what atomic energy developments may mean to the metalworking industry will find a wealth of helpful information in Dr. Allen G. Gray's article "The Facts About Atomic Power in Industry" (p. 86) in this issue. Although to date applications of atomic energy have been far removed from met-

alworking activities except for the occasional use of radioactive tracers, it is believed that in due time the indirect effects of progress in atomic enterprise will fan out in many directions and ultimately will be beneficial to the metalworking industry.

A pertinent question at this early stage is "How can I be sure my company is not passing up a good bet on some phase of atomics?" Dr. Gray advances several good answers (p. 91) to this question: Designate a man to keep abreast of the literature on atomics, incorporate a hot lab into your research setup, assign a man to a national atomic laboratory for a year of experience, or become a supplier of instruments, equipment or materials needed in atomic work.

* * *

TOO FEW ARE BEAVERS: American Institute of Management has conducted a survey of 2000 directors of supposedly "excellently managed companies" and has drawn a number of conclusions from the returns. The "average" director is 65 years old (p. 60), was born in the East, attended college there, still lives there, owns a little stock in his company, and is "not very civic minded."

Ignoring the provocative factor of the geography of a director's place of birth, education and residence, one's attention is drawn to the average age of 65 and to the conclusion that the typical director is "not very civic minded." Both are valid indictments. Able men should be elected to boards earlier in their careers. As to civic mindedness, in many communities a few industrialists are active in dozens if not scores of civic enterprises, while hundreds of their contemporaries drag their feet.

A more equitable division of civic responsibility among industrial executives would greatly enhance industry's prestige in the public mind.

* * *

A BOON FOR HARDWARE: Several years of large volume residential, commercial and industrial construction have been a boon to manufacturers of builders hardware. They wonder whether sales in 1953 will equal the estimated total of $220 million of 1952. The outlook is encouraging.

Building hardware is anything in metal that operates a door or window. Locks constitute 35 per cent of the market. An innovation of the last five years (p. 69) has been the introduction of aluminum for many items of builders hardware. Cylindrical locks, with keyhole in the knob, have gained wide acceptance. If you have built a home recently, it probably is equipped with this type of lock. About 80 per cent of residential installations take this postwar version of household security.

* * *

USE MORE PER CAPITA: There is food for thought in the announcement by the American Iron & Steel Institute that 15 nations consumed 300 pounds or more of crude steel per person in 1951 (p. 69), whereas in 1938 only seven countries consumed steel at that rate. The 15 nations in order of consumption per capita in 1951 were United States, Canada, Sweden, Australia, United Kingdom, Belgium-Luxemburg, Germany, Switzerland, France, The Netherlands, Russia, Brazil, Chile, Peru and Venezuela.

United States leads with a per capita consumption of 1347 pounds. Canada is second with 805 pounds. Consumption in the others as named tapers down to just above 300 pounds for Russia and the Latin American countries. Of course many factors contribute to the wide variations in steel consumption, but may not this be a good criterion: Steel consumption per capita is highest in countries where the ability to buy is most widely (and perhaps most evenly) distributed?

* * *

TASTE DOESN'T CHANGE: Anybody in metalworking who supplies materials, parts or services to mass production manufacturers should be intensely interested in the factor which appliance people call market saturation. For instance (p. 77), the Radio-Television Manufacturers Association reports that 47 per cent of the homes with radios have TV sets. This would seem to indicate a wide open market for more TV sets.

Consider statistics in a midwest area that is well served by TV stations. A recent count showed 700,000 TV receiving sets, 660,000 telephones and 620,000 bathtubs. This means that many low income families have accepted TV more readily than they have accepted the services of a phone or a bath tub. There is nothing new or strange about this. Thirty years ago thousands of households had a $300 tulip-horned gramaphone before they had running water or toilet facilities in the house.

Perfect Fit for a Filly

Another example of how Carpenter Application Engineering Service is working for industry

The average race track fan rarely gives a thought to the science that goes into pushing a winning horse across the finish line. The truth is that nothing—even down to the fit of a pony's shoes—is left to chance. And you'd be surprised at some of the problems encountered.

The horseshoe shown here is a good example. The manufacturer was using SAE 1060 steel to make the toe and heel calks. But when the shoe had to be bent cold for an exact fit on the horse's hoofs, the toe calk broke too often because the SAE steel couldn't take the bend.

And that's where Carpenter Application Engineering Service went to work. The Carpenter representative demonstrated how Solar (Water-Tough) Tool Steel, engineered by Carpenter some years ago, will bend cold without breaking at a hardness of Rockwell C-58/60. Now, with Solar, not only is the breakage problem solved, but the life of a set of shoes more than doubled—going up from about three weeks to seven weeks!

Time and again manufacturers are finding new ways to make products work better, sell better, cost less . . . with the help of Carpenter Application Engineering Service. A.E.S. goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. Isn't it worth a try? THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

core of the corps...

The core of Inland's strength is the one out of three Inland people with more than 15 years experience in making Inland steel. These men recognize your orders by name as well as number and draw on their familiarity with your needs and particular requirements to give the personal attention that is a specialty at Inland.

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Too Little Post-Defense Planning

25.2% HAVE PLANS | **74.8% HAVE NO POST-DEFENSE PLANS**

Percentages based on a STEEL survey of 1152 metalworking executives

"IF YOU don't already have a plan for meeting the anticipated lag in defense production, you're definitely late."

That comment by C. C. Sigmier, board chairman of Parker Appliance Co., Cleveland, underscores the revelation (above), in a STEEL survey of 1152 metalworking executives, that only 25.2 per cent have formal post-defense planning programs. Not all firms need the same kind of post-defense planning, says Mr. Sigmier, but they need something. Parker, for example, specializes in engineered parts and services and takes years to develop new products, many of them for the aircraft industry. A screw machine plant could get along with much less forward planning because its output can be shifted from defense to civilian work more rapidly.

Why Plan?—Companies who are studying post-defense markets carefully say that such planning is a must for three major reasons: 1. The impetus to the economy given by defense spending comes partly from facilities expansion, the peak of which is now past, as the following story indicates. More civilian production will be required to renew the economic zip that could soon falter noticeably as expansions are completed. 2. Although the Eisenhower Administration is committed to a stay-tough policy against Communists, government agencies now are trying to cut the budget to the bone. Cut-backs and stretch-outs in military requirements for some hard goods are certain. It makes sense to plan for greater civilian output just in case any changes decreed by Washington are for what you make. 3. Planning for new post-defence conditions is wise as insurance alone. Who knows what will happen in the cold war? It's possible, if not probable, that it might even fade to nothing.

In fiscal 1952 Treasury disbursements for defense hit $39.1 billion. It will be higher in fiscal 1953, then drop off again (if Mr. Eisenhower gets his wishes) for fiscal 1954. M. Joseph Meehan, director of the Commerce department's Office of Business Economics, estimates the cost of maintaining our projected military establishment will average $40 billion or more a year for some time to come. Even if military spending does go along at that steady pace, metalworking's participation in it will probably drop because defense expansions are declining, as mentioned above. According to the survey, 83.5 per cent of metalworking did some defense work in 1952, but only 82 per cent expect to do some in 1953. That's a small drop, yet significant.

How To Plan — If you're convinced you need a post-defense plan, the first question to consider is: How much for defense, how much for civilian in the long run? STEEL finds that the average is 25 per cent for defense, 75 per cent for civilian. Of course, that varies widely according to the type of business. An electronics or aircraft company may figure that 25 per cent is far too low for defense because of its special circumstances. An appliance maker may feel that 25 per cent is too high a volume.

The second question to consider in your post-defense plan is: How to compensate for any loss of defense business in the post-defense period? The survey shows that of those who have formal plans, 40.3 per cent will seek a larger share of the normal civilian market, 22.8 per cent will introduce new products and 36.9 per cent will do both.

Case Studies in Planning — Here's how some firms hope to prepare for any eventuality:

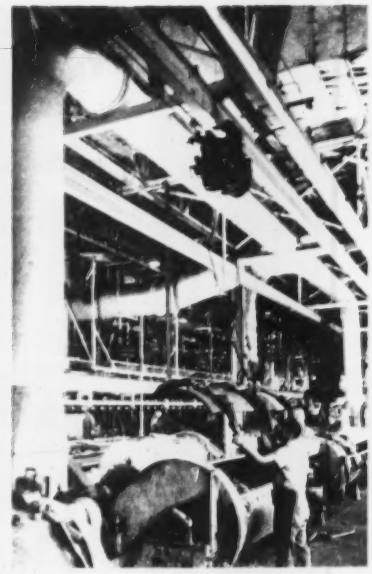
Reo Motors Inc. found that two-thirds of its $150-million sales volume last year went for military contracts. The Lansing, Mich., firm plans a diversification program to turn more production into civilian channels. Reo will enter the wheel goods business (having purchased the special tooling and manufacturing rights of the Pal Wheel Goods Division of Northern Indiana Steel Supply Co.), the production of an inboard engine kit for small boats and activation of a division for making industrial and marine engines. Reo has also formed Reo Truck Leasing Inc., a wholly-owned subsidiary for coast-to-coast truck leasing operations.

Parker Appliance Co., working through its Product Development Division, has been striving to develop new civilian products which Parker has timed to introduce to fit in with the anticipated slowdown in defense work. Military output, which currently runs between 60 and 70 per cent of the firm's total, is expected to dip to somewhat above 38 per cent by 1956. Parker's efforts have not

been toward diversification, though company officials do not rule it out entirely, but toward penetration in markets with which they're familiar.

Sperry Gyroscope Co., Great Neck, L. I., doesn't expect any great dip in its operations once defense requirements begin to lag because Sperry has developed its commercial field much more in recent years than ever before. They expect some drop in employment and in subcontracted work, but not a great deal as their employment has risen from 5000 to 18,000 workers since 1946 at a fairly steady rate with little impetus from the Korean war. Sperry will concentrate on distribution of its regular lines of marine and aviation instruments.

Palley Mfg. Co., Pittsburgh, hasn't had much defense work since 1951. This manufacturer of appliance cabinets and kitchen equipment has a formal program, with meetings twice a month, to design products for outside the kitchen and to widen distribution.



Buick Cleans Up

An immense air conditioning system in the Buick Foundry, Flint, Mich., transforms a traditionally dusty area into a safe, comfortable place to work. Ducts suck dirt and metal chips to magnetic separators and dust arrestors on the roof where the air is washed

GNP Hits $346 Billion

Commerce department report lists record industrial accomplishments of 1952

NEW HIGHS for nearly every basic economic indicator were recorded in 1952, according to the Commerce department's Office of Business Economics.

Gross national product, the market value of the nation's output of goods and services, was $346 billion in 1952, compared with $329 billion in 1951. National income, which measures output in terms of the total income earned in production, advanced from $277.5 billion in 1951 to $290.5 billion in 1952. Half of the 5 per cent rise in dollar value of output represented expansion in physical volume; the remainder reflected the further price increase. Personal income — the sum of income receipts from all sources — amounted to $268.5 billion, 5.5 per cent more than the total for 1951.

The Rate Slows Down—The rate of advance in economic activity was not so large as in 1951 — the first full year of the impact of the enlarged defense program. The expansion in government expenditures continued to play a major role, but the increase was more gradual than in 1951. The unusually high rates of business inventory accumulation which had added materially to the inflationary pressures of 1950 and early 1951 were markedly reduced as businessmen brought stocks into line with current sales. Consumer spending amounted to 92 per cent of disposable income, about the same as in the preceding year. The rate of personal saving, at about 8 per cent, continued to be double the average for 1947-1949.

In the factors contributing to gross national product, personal consumption expenditures hit $216 billion, $8 billion more than in 1951. Gross private domestic investment fell from $58.5 billion in 1951 to $52 billion in 1952 because of the drop in the rate of inventory accumulation. Government purchases of goods and services rose from $63 billion in 1951 to $78 billion in 1952.

National Income—In factors con-

Industry Slows Expansion Under ODM

HIGH WATER mark of the current mobilization program was reached in the second quarter of 1952, and the pace of industrial expansion has since declined, the Office of Defense Mobilization reports.

ODM estimates that during 1953 additional facility expansion amounting to $10.5 billion will be completed, bringing the total of completed expansion to $18.5 billion by the end of this year. In 1954, defense mobilization will approach completion of expansion under certificates of necessity issued by Sept. 30, 1952.

Slight Drop-off — Work put in place during the third quarter last year on 13,153 projects aided by tax write-offs was $1581 million. This is $144 million less than work put in place on 11,302 projects in 1952's second quarter.

ODM indicates that over half of the total cost of facilities expansion projects reported by the end of the third quarter, 1952, is concentrated in seven industries. Among the leaders are railroads, steel works and rolling mills, aircraft and primary refining of aluminum. All showed a decline in value of work put in place in the third quarter last year, compared with the second quarter.

Expansion Rate Dips — Steel works and rolling mills put $194 million worth of work in place in 1952's second quarter, and $170 million in the third quarter, on projects covered by certificates of necessity.

Looking forward to completion of current mobilization, ODM expects the following industries to complete facilities expansions by Sept. 30, 1954: Coke oven by-products; aircraft; aircraft parts and auxiliary equipment; iron and steel foundries; aircraft propellers and propeller parts and primary refining of aluminum.

Slow Starters—Construction has not yet started on many projects mentioned in the ODM report. As of Sept. 30, 1952, 895 projects with an estimated cost of $2208 million, representing 10 per cent of the total cost of all projects, had not been started.

tributing to national income, the government compensation to civilian and military personnel showed the largest rise, 12 per cent. Compensation of employees climbed from $179 billion in 1951 to $190.5 billion last year. Corporate profits after taxes slid about $1.5 billion. Total proprietors' and rental income advanced from $50.5 billion to $52.5 billion. Farm income slipped. Nonfarm business and profession proprietors' income at $28 billion was 5 per cent larger than in 1951.

Total new capital requirements of corporate business exceeded $30 billion in 1952, about $9 billion less than the record volume in 1951.

Modifies Metals Policy

Virtually free domestic trading in tungsten and molybdenum concentrates has been restored, the Defense Materials Procurement Agency announces. The changes don't apply to end-use controls of tungsten and molybdenum administered by the National Production Authority.

Under an amendment to DMPA's tungsten regulation, producers and dealers no longer must obtain allocations authorizing shipments to consuming firms. Consumers are no longer required to obtain authorization unless they want to buy tungsten ore of foreign origin purchased for resale by the General Services Administration.

DMPA points out that although the tungsten supply situation has eased up enough to drop allocation, the bulk of domestic production has found a ready market.

Modification of the tungsten order won't affect the government's five year domestic purchase program. This runs to July 1, 1956, or until 3 million net short ton units of contained tungsten trioxide have been purchased.

Basalt Rock To Build New Mill

Basalt Rock Co., Napa, Calif., will build a mill for the fabrication of large diameter pipe at the Fontana, Calif., site of Kaiser Steel Corp., with preliminary operation scheduled by July 1.

A. G. Streblow, Basalt president, says that the new plant will produce diameters above the 36-inch maximum of the Napa mill. Most of the plate for fabrication of the pipe will come from Kaiser Steel.

T-H Changes: They Won't Be Much

When the smoke clears away, the amendments to Taft-Hartley won't be significant. The majority in Congress opposes marked changes

STATEMENTS, counterstatements, charges and proposals about changes in the Taft-Hartley Law have reached the flood mark.

But the flood will probably have little effect on T-H except to change it in a few minor ways. The reason: Senator Taft doesn't want to change it much; the majority sentiment in Congress currently opposes major change; and the groups that do want change the unions to weaken it, some management organizations to strengthen it will balance each other out.

REP. CARROLL D. KEARNS
. . . his T-H change may be accepted

No Sensations—Nor is anything remarkable in recommendations likely to come from the high-powered committee named to advise Secretary of Labor Martin Durkin in his study of T-H. Public members of the group include Cyrus Ching, former Federal Mediation Service director; and Professors Sumner H. Slichter of Harvard, Jean T. McKelvey of Cornell, Maurice T. Van Hecke of the University of North Carolina and Paul A. Dodd of the University of California. Industry members include Harry Moses of the Bituminous Coal Operators Association, David Zellerback of Crown-Zellerback Corp., John J. O'Donnell of the National Constructors Association, Ben Moreell of Jones & Laughlin Steel Corp. and Frank Rising of the Automotive & Aviation Parts Association. Labor members include George Meany of the AFL, Walter Reuther of the CIO, David J. McDonald of the United Steelworkers and John L. Lewis of United Mine Workers.

Initial committee meetings held last week were reported "harmonious," but labor observers believe that some of the fiery temperaments among public, industry and labor members will make harmony decidedly temporary.

The Changes—What then will be changed, even in a minor way? Almost certain to be modified will be the National Labor Relations Board. Senator Taft would increase it from five to seven members. A similar proposal in the House (H. Res. 3146) introduced by Rep. Carroll D. Kearns (Rep., Pa.) would boost the membership to nine. Another amendment to the labor law that currently appears certain of passage is the requirement that employers as well as union officials sign non-Communist affidavits.

Amendments that have little chance of ever getting into law in the present Congress include the proposed end of the 80-day court ban on strikes in national emergency labor disputes and a proposed ban on industry-wide bargaining.

Employment Record Set

December employment in the iron and steel industries reached a record high total of 684,400, which was 4100 higher than November and 9300 over December, 1951, says American Iron & Steel Institute.

Estimated 1952 payroll of $2,822,250,000 was only about $59 million, or less than a week's pay, short of beating the record year of 1951, despite the mid-summer steel strike. In December, workers earned an average of $2.211 an hour, which was about 26 cents higher than the average for first quarter, 1952.

Who Is the Average Board Member?

American Institute of Management's survey of 2000 leaders from the best companies in the nation shows some of the things he is and is not

MR. JONES, the average member of the board of one of America's "excellently managed companies," is 65 years old; was born in the East where he attended college and now lives; owns a little stock in his company but is not otherwise employed by it; and, generally speaking, is not very civic minded.

That description is gleaned from a survey of about 2000 directors of the select "excellently managed companies" list of the American Institute of Management.

Longevity—Youth may, indeed, have its day, but age will be served if the institute's figures are any indication. Only about 1 per cent of the directors are under 39 years old. From there it ranges up to one man who admitted to somewhere between 90 and 99, with the average being about 65. Average age of a company president is only 55.

The East and Middle West claim the birthplaces of most of the executives, as the table shows. Assuming that most of the men living in a given region were born there, the table indicates a rather low mobility among directors. The most significant variation from the pattern is that in the Middle Atlantic region. The explanation for that is easy: New York. The fact that more executives live on the Pacific Coast than were born there is an indication that business in that region is growing.

Well Educated—It is not surprising to find that 73 per cent of the directors of excellently managed companies went to college. It is a bit unusual, however, that the Middle West has only three universities which produced more than five of the executives surveyed. The bulk of them came from the East, with the old "prestige" schools, Yale, Harvard and Princeton, heading the list.

The salaries of these well-educated directors are above the national average. The average company has 18 men in its officer-director group, and as a whole they pull down $731,555 a year. The president gets more than the board chairman, as the table below shows, but there are some variations.

Unexpected — AIM reports that the survey showed a larger portion of company stock controlled by the average board member than the institute expected. Only one fact is clear from the findings, however: The smaller the company, the greater is the percentage of stock held by officers and directors.

The more than 2000 directors of the "excellently managed companies" hold a total of 9770 directorships. Over 62 per cent of the companies have outside boards (a majority of members not employed by the company), which AIM thinks is good.

One of the most important findings of the survey is that the average director engages in only 1.65 civic activities, with the range running from zero to 95. The average reported for social activities is 3.76, and the average board member participates in 1.25 business organizations. AIM says that the lack of civic activity "accounts for the wide gulf between top management and the common man in many company communities. . . . The welfare of all the people is a job for all of us particularly our leading men."

REMUNERATION & STOCKHOLDING BY SIZE OF COMPANY

	Chairman	President	Size of Officer & Director Group	Officers & Directors as a Group	Preferred Stock-holdings of Off. & Dir. as a Group	Common Stock-holdings of Off. & Dir. as a group
All Companies	$112,188	$124,162	18	$731,555	7.92%	8.02%
1-49 million $	76,520	91,965	15	464,147	9.23	9.45
50-99 million $	105,712	110,492	18	631,917	3.06	10.37
100-199 million $	103,755	117,375	20	875,493	6.97	4.82
200-299 million $	142,232	143,658	17	931,312	1.97	2.88
300-399 million $	159,293	183,981	22	1,079,423	9.10	4.89
400-999 million $	138,281	161,646	24	1,361,018		2.58
Over 1 billion $	154,517	241,054	25	2,127,801		3.55

Source: American Institute of Management

GEOGRAPHICAL AREA	BIRTH PLACE	PRESENT RESIDENCE
New England	12%	11%
South Atlantic	8	8
Middle Atlantic	27	41
East North Central	26	26
East South Central	3	1
West North Central	9	2
West South Central	3	2
Mountain	2	1
Pacific	5	7
Foreign	5	1

Source: American Institute of Management

COMPARISON OF BIRTHPLACE AND PRESENT RESIDENCE OF DIRECTORS

Chasing Outdoor Odors

Lorain Slag Co. shows much can be done toward eliminating repugnant industrial smells

OUTDOOR INDUSTRIAL "cooking" odors *can* be controlled. Proof of that pudding is found in the long strides taken to counteract annoying sulphur odors generated in production of expanded slag at the Lorain Slag Co., Lorain, O.

Expanded slag, a light-weight aggregate used in making building blocks, is produced by quick-cooling hot slag as it comes from the blast furnace. The hot slag, at about 2800 F, is dumped from ladle cars into open, outdoor concrete pits where water is run over it, expanding the slag particles and dropping their temperature some

1600 to 1800 in a matter of minutes. Sulphur odors are released in the quick cooling and the steam generated by the process carries the odors off into the atmosphere. Since Lorain Slag handles nearly 55 ladle cars in about 16 hours each day, the odor is quite intense at times.

The People 'No'—That's where the citizens of Lorain appeared in the picture over a year ago. Southerly and southeasterly winds carried the odors to nearby residential areas. Alarmed citizens began protesting to the city fathers of Lorain who, in turn, called in the Ohio Department of Health's Division of Industrial Hygiene to run a series of tests. Lorain Slag Co., facing up to the matter, was encouraged by its neighbor, U. S. Steel Corp.'s National Tube Division, to call in the Pittsburgh Testing Laboratories to make concurrent tests. Results: There was no dirt nor contamination nor other factor detrimental to health contained in the odors, but there was a strong smell of rotten eggs. And that odor was threatening the life of Lorain Slag.

Not a Cover Up—The answer came with Osmix 153, a product of Airken Inc., New York. Osmix 153, it was found, "counteracts" the odor of sulphur. It's not a perfume for the smell. The sulphur alone has a smell and the chemical has a smell of its own, but when the two mix in the atmosphere, neither can be detected without mechanical instruments.

For about one-twentieth of the cost of a mechanical trap and scrubber for the steam, Lorain Slag has installed a simple system of two nozzles at each dumping point along the open ditches. The nozzles, much like ordinary paint spraying equipment, shoot Osmix 153 out over the pits at the same time the water quenching is going on. Sulphur odor and chemical mist react with each other and pass off unnoticed.

It's too early yet to pronounce the system a complete success, says William Miller, plant superintenddent for Lorain Slag, because it just went into operation two weeks ago. "But, it's convinced us. We think it's a long step in the right direction."

More iron ore from Canada for American mills will result as . . .

Inland Leases Orebody at Steep Rock

INLAND STEEL CO. will spend $50 million to develop iron ore bodies it has just leased for 99 years from Steep Rock Iron Mines Ltd. in Steep Rock lake, northwestern Ontario.

Inland's Canadian subsidiary, Caland Ore Co. Ltd., will do development work at the orebody over a seven-year period and expects to attain a shipping volume of 3 million tons of ore annually when in full production. Steep Rock Chairman Cyrus Eaton termed that production estimate as "conservative." He says that the ore on Inland's lease assays at 62-64 per cent iron. Ore mined by Steep Rock itself in the past few years averaged 56-58 per cent.

Geography—The properties of Steep Rock Iron Mines are at Steep Rock lake, 140 miles west of Port Arthur, Ont. The range is on the main line of the Canadian National Railways. A spur of three or four miles will connect the 1200-acre Caland lease with the railroad. Inland will pay what Mr. Eaton terms a "substantial" royalty per ton of ore mined. Inland may eventually be selling some of the ore it gets from the leased properties at Steep Rock lake.

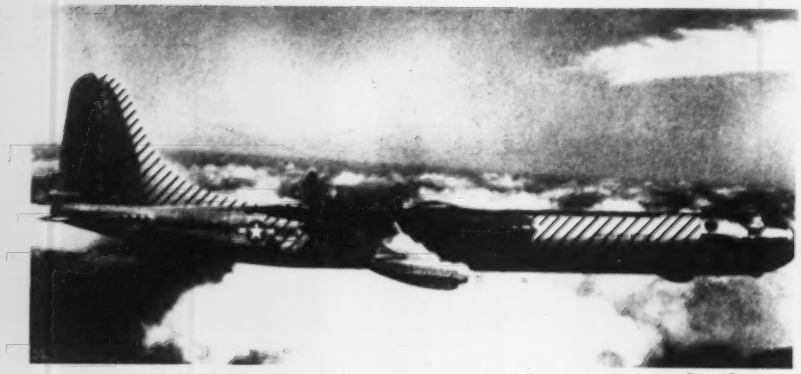
Adjoining the Caland lease is another 1200-acre tract upon which Pickands Mather & Co. has an option. As yet, Pickands Mather has done little pre-production drilling and exploring. Of the total 8500 acres of area in the Steep Rock property that's estimated to be ore-bearing, another 3600-4800 acres may eventually be leased.

Producer—Steep Rock, itself, has been producing ore continuously from the "B" orebody in the middle section of the former lake since 1944 and in addition is presently developing the "A" orebody and the newly discovered "G" orebody in the same section.

In 1952 Steep Rock shipped 1,275,000 tons from the Errington open pit in the "B" orebody and is now preparing the Errington underground mine to produce ore down to depths of several thousand feet. Production from this underground mine and from the Hogarth open pit on the "A" orebody is expected to begin this year.

Big Task—The big job of bringing the Caland mine into operation will start with removal of overburden to expose the orebody for mining operations, probably of the underground type. Ore boats will load the Caland ore from the Canadian National dock at Port Arthur. That port is 120 miles nearer Inland mills at Indiana Harbor than Superior, Wis., the shipping point for Mesabi range ore, and will result in saving almost a day each round trip.

Inland Vice President Philip D. Block Jr. says that the acquisition has given his company a strong position in iron ore reserves covering its requirements "many years into the future without the necessity of going to remote sources to supplement the reserves it has in the U. S."



Dow Chemical

Magnesium in the shaded area of this B-36 emphasizes . . .

Boom in Magnesium Wrought Goods for Defense

MAGNESIUM, the bantam-weight of structural metals, is packing a heavy punch in the defense arena. But wrought products of magnesium, rather than castings, are the items with the fastest upswing.

This boom in magnesium wrought goods really dates back to the years between World War II and Korea. Shipments of wrought items whizzed up 314 per cent in the three years just preceding Korea. Only about 20 per cent of those goods went into military items. Today, defense is taking upwards of 50 per cent of the magnesium wrought products. Production of magnesium castings in the three years before Korea increased only 63 per cent, with 70 per cent of the output ending up in military equipment.

Sheets Soar—Big factor in the rapid growth of wrought products for defense is the increased utilization of magnesium sheet. The giant B-36 carries 10,000 pounds of magnesium in its airframe alone. Another 9000 pounds of the metal goes into the superbomber's wheels, engines and miscellaneous parts. An even more modern utilization of sheet magnesium is in the rocket-propelled Douglas Skyrocket. Practically the entire fuselage of this Navy plane is made from magnesium sheet. Complete magnesium wings are also being built.

But ground forces procurement men are also interested in magnesium. Army Ordnance, which used little magnesium a few years ago, announces the nearest thing to an all-magnesium trailer magnesium frame wheels, skin and even interior equipment. This 21-foot vehicle, which controls antiaircraft fire, can be hauled over land, transported by air and floated across rivers. Designed by Bell Laboratories and Douglas Aircraft, the trailer is built by Western Electric Co., Glenn L. Martin Aircraft Co. Inc. and Fruehauf Trailer Co.

Magnesium Show — Processes used in the manufacture of magnesium goods will be demonstrated at the First International Magnesium Exposition at the National Guard Armory in Washington Mar. 31 Apr. 2. Magnesium welding techniques will be demonstrated by the Aluminum Co. of America, deep drawing by Brooks & Perkins Inc., impact extrusion by Dow Chemical Co. and tube bending by the Magnesium Co. of America.

Award Aids Titanium Work

Worcester Pressed Steel Co., Worcester, Mass., has been awarded an Army contract to study forming properties of titanium. Research will be concerned with both alloy and commercially pure types of differing thicknesses.

Company spokesmen say some new equipment will be used in a general program to determine the most efficient means of drawing titanium.

Changes Purchase Program

The government has revised its purchase program for small manganese producers to include manganese in form of furnace slags as well as ores and concentrates. To be accepted under the program, slag must meet the same specifications as ores and concentrates, the Defense Materials Procurement Agency says.

In exceptional cases the government will accept manganese ores with a silica-alumina content above 15 per cent. As before, penalties apply if this is above 11 per cent.

Small amounts of the higher-silica manganese ores can be used in making ferromanganese.

Ordnance Tests New AA Gun

Army Ordnance is testing a new weapon to keep the skies clear of enemy planes. Called the Skysweeper, it's a 75-mm antiaircraft gun capable of spotting an airplane 15 miles away and knocking it down at a distance of 4 miles away, and all automatically.

The Skysweeper was designed to guard against planes flying at low and medium altitudes at near-sonic speeds in any kind of weather. The brain of the weapon is a computer made by Sperry Gyroscope Co., Great Neck, N. Y. Radar tracks the enemy across the sky, transmitting speed, altitude and direction information to the computer. The gadget aims the gun so that a shell fired at any instant will intercept the target and destroy it.

Radar, computer, gun and mount are assembled in an integrated unit by Aetna-Standard Engineering Co., Ellwood City, Pa. It weighs 10 tons and can be transported either by land or by air.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Lathes, Turret	Gisholt Machine Co., Madison, Wis.
Aircraft Parts	Lockheed Aircraft Corp., Burbank, Calif.
Aircraft Pumps	Lear Inc., Romec Div., Elyria, O.
Fan Assemblies	Benson Mfg. Co., Kansas City, Mo.
Parts for Instruments	General Electric Co., Schenectady, N. Y.
Radio Sets	Hallicrafters Co., Chicago
Radio Receivers	Zenith Radio Corp., Chicago
Receiver-Transmitters	Allen B. Du Mont Laboratories, Clifton, N. J.
Shells, Mortar	Schnaible Co., Cincinnati
Shells, 20 mm.	Pantex Mfg. Corp., Pawtucket, R. I.
Fuzes	Gruen Watch Co., Cincinnati
Combat Vehicle Parts	Kelsey-Hayes Wheel Co., Detroit
Automotive Tools	Chase Brass & Copper Co., Waterbury, Conn.

Copper, Aluminum Freed

OPS drops price controls on metal commodities, but steel curbs remain

COPPER AND ALUMINUM are free from price control. The Office of Price Stabilization also orders decontrol for producers of bolts, nuts, screws, rivets, mechanical precision springs, metal stampings and screw machine products of any metal. For reaction to the nonferrous move, see p. 165.

OPS is lifting the ceilings to relieve a critical supply shortage brought about by price differentials between copper and aluminum scrap, secondary metals and primary metals.

Price Rise — OPS anticipates price rises, some fairly sharp. Domestic electrolytic copper may rise by 3 cents a pound, but no immediate change is seen in aluminum prices. Copper producers say their industry outlook is somewhat confused and the extent of price changes is difficult to predict.

Remaining under price ceilings are products accounting for about 28 per cent of the Bureau of Labor Statistics wholesale price index. OPS still holds the reins on iron, steel, magnesium and nickel. The latest action by OPS gave no indication whether an unexpectedly quick decontrol of these metals was in store.

Lids Lifted—The list of metal commodities decontrolled includes: Alumina and bauxite; primary aluminum and aluminum alloy ingot, pig and other shapes; aluminum mill products and aluminum powder and paste. Also decontrolled are: Copper ores; primary refined copper; copper powder; brass mill products; copper wire mill products and screen cloth and all other woven wire products made from copper and aluminum. Price controls on scrap and secondary metals were eliminated Feb. 12.

Decontrol action takes effect immediately at all distribution levels.

Westinghouse Had Good Year

Westinghouse Electric Corp., Pittsburgh, reports that 1952 was the second best year in its history for net income and the best year in net sales billed. The annual report shows income pegged at $68,581,603, an increase over 1951 of 6 per cent, and record sales of $1,454,272,598, a whopping increase of 17 per cent over 1951.

At the same time, the company reported it has spent $101 million on its current $296-million expansion program that was started in 1951. That has added 3 million square feet to the manufacturing area, and an additional 3.5 million square feet will be added in 1953.

Included in the latter figure will be a new multimillion-dollar plant for the production of atomic power plant equipment. It will be operated by the newly-formed Atomic Equipment Department.

The Screw Machines Go Rolling Along

Browne & Sharpe Mfg. Co., Providence, R. I., claims a "first" for the adaptation of a twin roller conveyer system to the simultaneous assembly of three lines of automatic screw machines. Eight stations on the assembly line each require an equal number of man hours. Pictured are duplicate conveyers, one for the OOG automatic screw machine and one for the larger OG and 2G models

CHECKLIST ON CONTROLS

Materials Orders

CONVERSION STEEL — Amendments of Feb. 24, 1952, of Direction 3 to NPA Order M-46A and Direction 5 to NPA Order M-46 extend through the second quarter the self-authorization privilege granted to gas and oil operators to acquire up to 500 tons of finished carbon conversion steel for use in approved construction projects. Both amendments were effective Feb. 24.

OIL, GAS OPERATORS—Amendment 1 of NPA Order M-46, issued and effective Feb. 24, 1953, removes the requirement that oil and gas operators must file delivery orders for information and reduces the number of delivery orders for materials other than controlled materials which must be filed for approval. It also permits an operator to self-certify for uncontrolled materials up to $7500 for any single order or $2500 for any line item.

Price Regulations

AUTOMOBILES—Amendment 7 of Revision 1 of CPR 1, issued and effective Feb. 19, 1953, requires that automobile manufacturers, in pricing new products by comparison with items already in production, must take into consideration original tooling costs on the latter.

PASS THROUGH—General Overriding Regulation 43, effective Feb. 27, 1953, permits pass through increases in ceiling prices on contained alloy metals as follows: Nickel, 3.5 cents per pound; cobalt, 30 cents per pound; beryllium, 5.22 cents per pound; chromium and high-carbon ferrochromium, 3 cents per pound; SM grade ferrochromium, 3 cents per pound; low carbon ferrochromium, 4 cents per pound; ferrochromium-silicon, 4 cents per pound; chromium-manganese-silicon alloys, 4 cents per pound; chromium metal, 4 cents per pound; ferrosilicon chromium, 4 cents per pound; nickel and chromium in stainless steel, 3 per cent for type 300 and 2 per cent for type 400 and type 500.

STRUCTURAL STEEL—Amendment 2 of CPR 156, issued and effective Feb. 24, 1953, clarifies the term "fabricated structural steel, miscellaneous and ornamental iron and vessel shop products."

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Life expectancy of SDPA is lengthened by vote of Senate committee. Some think SDPA should have the power to make loans to business, now that RFC appears doomed

WIDESPREAD CONGRESSIONAL sentiment was reflected when the Senate Small Business Committee voted unanimously to extend the life of the Small Defense Plants Administration.

A controversy developed concerning whether the small business agency should continue as an independent unit of the federal government or whether it should be put under the secretary of commerce. This question is being studied by a presidential committee, of which Nelson A. Rockefeller is chairman. The President has not taken a position.

Businessmen Take Preference—SDPA had produced a large sheaf of testimonials from small businessmen throughout the country who wanted that agency continued on an independent basis. They liked the effective manner in which the SDPA swung more government procurement to small business, and the way it was helping small business borrow money from the Reconstruction Finance Corporation.

Now that many congressmen seek the demise of RFC by 1954, a new power is being sought for the SDPA, that of making direct loans to business. The private-industry-minded administration is not expected to approve this proposal and support in Congress is doubtful.

SDPA Helped—A sound political reason for expecting Congress to extend the life of SDPA concerns complaints from their small business constituents about materials allocations, price ceilings and government procurement. These are handed to SDPA for attention, taking a load off the congressman's shoulders.

Urges FTC Reform . . .

"Trial by ambush" is Federal Trade Commissioner Lowell B. Mason's characterization of the commission's refusing to divulge to defendants the details of charges against them.

"Because the new administration has been labeled conservative," he says, "we shall be in a better position to resist reaction than our predecessor was," but he favors a more realistic approach to the antimonopoly problem than that of the past. "Our refusal to settle questions under the antitrust law except by litigation is a vicious bar to enlightening businessmen."

Mr. Mason, who long has asked a sweeping reform of FTC philosophy and procedure, and who now appears headed for the chairmanship, is expected to have a working majority when the President appoints new commissioners.

Guide for Tool Buyers . . .

A practical, comprehensive list of machine tools and metal forming equipment needed by the armed services in event of full mobilization has been completed by the Munitions Board. The list is intended as a guide for spotting gaps in existing production equipment capacity. This will permit a surer approach in planning expansion in this sector of industry.

Munitions Board spokesmen say the list represents only a start toward defining full mobilization needs. It is to be revised at six-month intervals. Details are confidential. The list will eventually include mobilization needs for all military end-products.

List Full Mobilization Needs . . .

Strategic and critical materials already stockpiled or on order represent 78 per cent of the total stockpile objective in dollars, the Munitions Board reports. During the last half of 1952, the report continues, stockpiling of 18 items was completed and inventories of 38 other materials reached 60 per cent.

LABOR FINDS A NEW WEAPON
. . . in the ubiquitous T-shirt

NLRB Aids Shirt Makers . . .

The National Labor Relations Board continues to make life interesting for employers as shown by a recent decision.

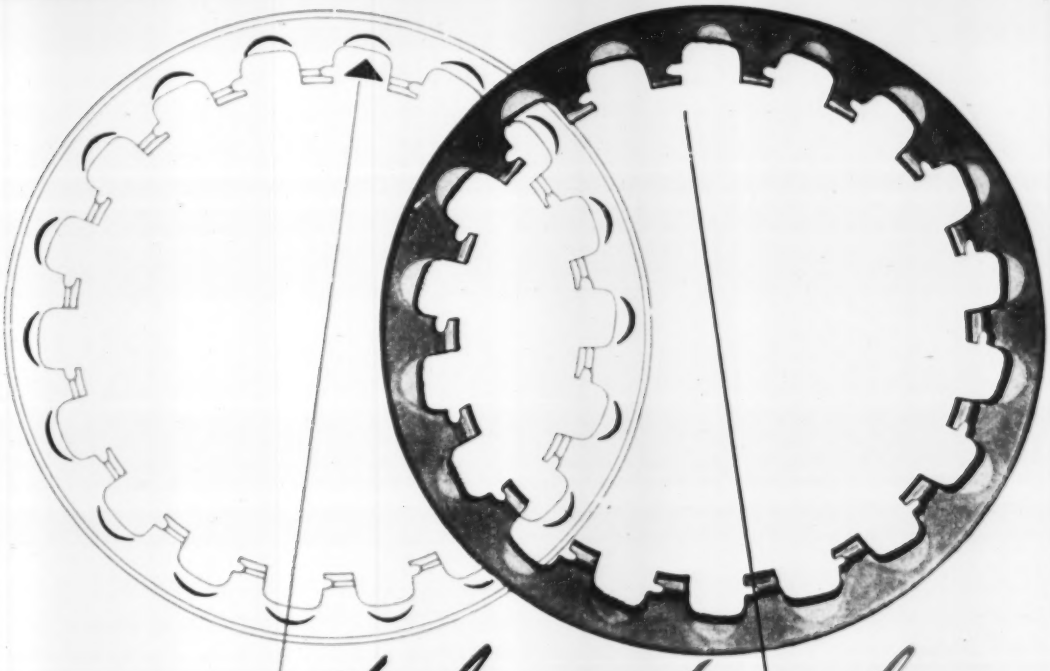
DeVilbiss Co., Somerset, Pa., objected to its workers sporting T-shirts bearing the name of the CIO Auto Workers Union, plus the slogans "Vote," "Join," or "Support." The company felt that such shirts should not be worn on the job.

NLRB upheld the view of its trial examiner, Ralph Winkler, that the company's objections were an illegal interference with union activities.

To Study Social Security . . .

After rejecting the Eisenhower proposal for a continuance of existing federal taxes until more is known about budgetary needs, the House Ways & Means Committee turned down the President's plea for extension of social security coverage.

The committee decided against quick action and set up a subcommittee to study the entire social security system which means no possible action until 1954. Chairman of the subcommittee is Rep. Carl T. Curtis (Rep., Nebr.).



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high production	60 parts per hour
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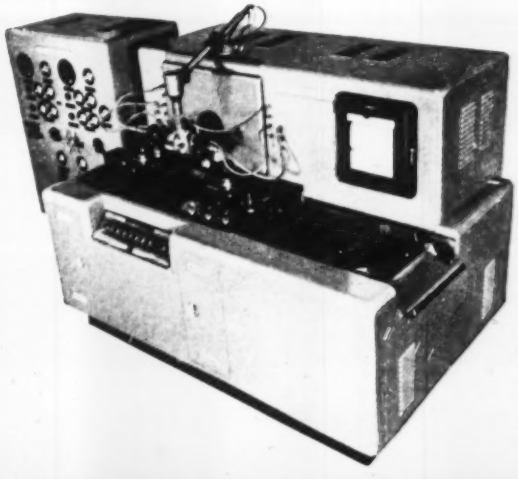
with flamatic selective surface hardening



If ever there was one, here's a really tough heat treat job. The print called for all 18 internal lobes of this tank transmission cam (SAE 3145) to be hardened to Rc 53-60, body between lobes to remain ductile, pattern so consistent that inspection of only 1% of production would be permissible.

The nital etched section shown above (about half size) clearly shows the results achieved by Flamatic selective hardening. Production of 60 parts per hour was ten times faster than previous method. Scrap losses dropped practically to zero.

Gears, cams, rollers, parts with multiple diameters, etc., up to 18" OD depending on width or shafts up to 24" long depending on OD are readily handled on the Standard Flamatic. Write for Catalog No. M-1724 which includes case histories. Send part prints for analysis and recommendations.

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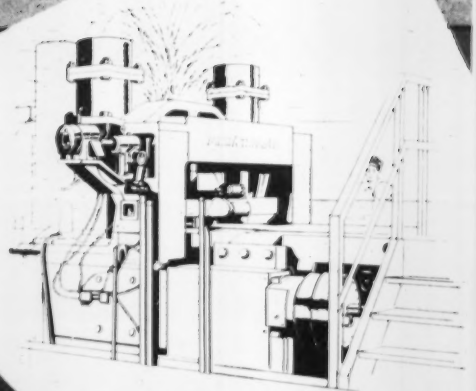
MESTA

HIGH-SPEED
CONTINUOUS PICKLING LINES

BATTERY OF FOUR MESTA HIGH-SPEED CONTINUOUS PICKLING LINES WITH TRIMMERS, UNCOILERS, AND MESTA-THOMSON FLASH WELDERS

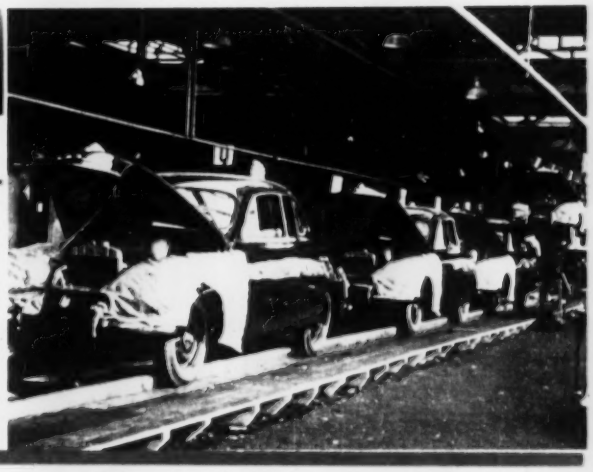


MESTA-THOMSON FLASH WELDER INSTALLED IN A MESTA HIGH-SPEED CONTINUOUS PICKLING LINE

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



At left, workers at the Zis automobile plant in Moscow check refrigerators for home use. The cars at right are the Czech Skoda 1200. Consumer goods represent only 25 per cent of industrial output of Iron Curtain countries

Lopsided Expansion Behind the Iron Curtain

Poland has released figures on big gains in industrial production during 1952. But, the fact remains that less than one-quarter of it goes into consumer goods

EASTERN EUROPEAN industrial capacity has been growing apace with activity on the western side of the iron curtain. In contrast with demand problems now facing western countries (see Feb. 23, p. 61), though, Eastern European producers are still pushing expansion for their major outlets military goods and capital equipment.

In Poland, for example, industrial production rose 20 per cent during 1952, according to the Polish National Planning Commission. Although Poland attained only 98 per cent of the 1952 goal in her latest Six Year Plan (1950-1955), that output was 14 per cent higher than originally hoped for by the planners three years ago.

Heavy Additions—The increases in selected products percentagewise over 1951 were: Pig iron, 13 per cent; steel 14 per cent; rolled products, 10 per cent; crude oil, 19 per cent; natural gas, 13 per cent; electric power, 14 per cent; antifriction bearings, 29 per cent; electric motors of more than 100 kw, 24 per cent and machine tools, 12 per cent.

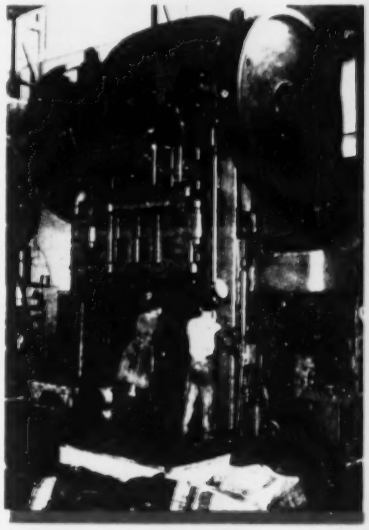
New products made in Poland last year for the first time included high grade cast iron, certain steel products such as tin plate and steel tubing, new types of pharmaceuticals, electrodes and fertilizers.

Even Stalin—Similar steel output hikes elsewhere in the Soviet Union gave those countries a total production of about 47.8 million net tons in 1952. That closely rivals the total for Western European producers of about 51 million tons.

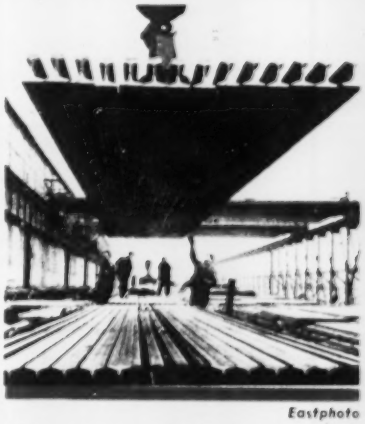
In back of these substantial increases are heavy investments in capital equipment and accent on the manufacture of military items. Consumer goods still account for less than 25 per cent of total industrial output in the Soviet Union, which is one reason there are no oversupply problems behind the iron curtain.

IBRD Loan for Yugoslavia

Yugoslavia has received a $30 million loan from the International Bank for Reconstruction & Development to finance projects in: Electric power, coal mining, nonferrous metal extraction and processing and iron and steel production. No dollars are to be loaned.



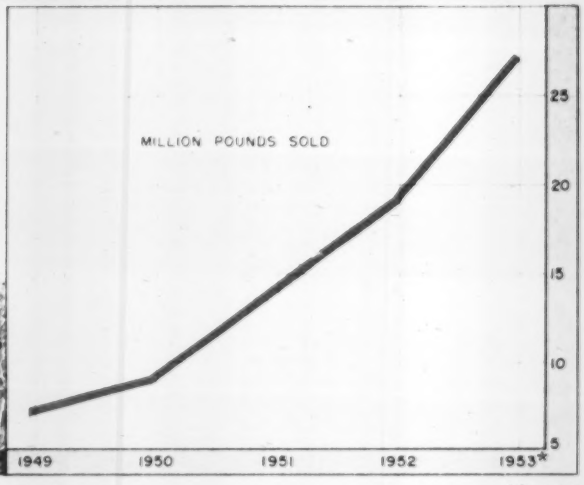
A giant pressing machine produces parts for cars in Czechoslovakia



Eastphoto

But much more production goes into militarily important items as these rails being loaded at Azov, Russia, steel plant for "projects of Communism"

Sales of Polyester Resins for Reinforced Plastics



Source: Society for the Plastics Industry, Inc.

* Estimated

Reinforced Plastics Sales Leap Upward

The bright new plastics world creates ready markets with products ranging from insulation to auto bodies. Reinforcing materials and new resins are the key

REINFORCED PLASTICS sales are growing at the rate of 40 per cent per year (see the chart). The market for plastics-producing and molding machinery is growing correspondingly.

Uses range all the way from small radio parts to complete auto bodies. Newest: Aircraft structures for supersonic jets and guided missiles that cannot be detected by radar.

Plastic automobile bumpers with a bright nickel-chrome plated finish are being looked at experimentally by at least one automaker.

Building Blocks—Basic components of this new structural material are a plastic resin—polyester, phenolic, silicone, melamine, epoxy or polystyrene—and a reinforcing material, such as fibrous glass, paper, cotton, sisal, or asbestos. Fibrous glass type predominates.

The prediction of radar-proof aircraft structures is based on test results on a new plastic resin developed by Bakelite Co., and coated on Fiberglas cloth which were announced by Zenith Plastics Co. at the Reinforced Plastics Conference of the Society of the Plastics Industry in Washington, Feb. 18-20. As far as radar frequencies are concerned, the new reinforced plastics are almost completely electronically transparent.

Versatile Properties—Combining characteristics of two different components, reinforced plastics have exceptionally high strength with low weight. They have good impact resistance and dimensional stability, maintaining their molded size and shape under stresses and temperature extremes. They resist weathering and rot, many chemicals, acids, oils and solvents.

Making of a reinforced plastic product usually starts by saturation of the reinforcing material with a liquid or viscous resin. The two components are put together in various proportions and may be molded or laminated by a variety of different processes using various types of dies, presses and other equipment. Chemical catalysts added to the resins induce hardening within a predetermined time cycle.

Here's Where They Go—Navy boats over 40 feet in length are currently being made of reinforced

Vacuum bag molding is used by the Glastic Corp., Cleveland, to cure glass-reinforced plastics. Vacuum holds resin-impregnated cloth tightly against a form.

plastics. Aircraft domes, fishing rods, oil and water transmission pipe, chairs, business machine parts, and automatic washing machine tubs are mass produced from the material.

Plastic producers are predicting that the next few years will see increased use of these super strength plastics in refrigerators, bath tubs and other home appliances, in truck bodies and station wagon bodies, in farm equipment such as troughs and tanks, in garage doors, school desks and similar equipment, in kitchen cabinets, and in components for building construction such as gutters.

Clarify PECIG's Purpose

To correct misconceptions about the availability of government-owned machine tools from the Production Equipment Central Inventory Group, officials explain that equipment in PECIG is for lease only to defense-supporting activities and defense contractors. Their subcontractors should request this equipment only through military channels.

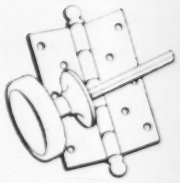
Requests for defense-supporting equipment will be carefully screened by the National Production Authority as to the importance of items being produced and the availability of requested equipment before NPA approves.

Since May, 1952, PECIG has allocated more than 10,500 tools.

Per Capita Steel Usage Rises

Fifteen nations consumed 300 pounds or more of crude steel per person in 1951, with the United States far in the lead, reports the American Iron & Steel Institute. In 1938, only seven countries used that much steel.

A semiofficial source in Washington compiled the figures, taking into account estimated production, imports, exports and population. U. S. consumption per person was figured at 1347 pounds, followed by Canada with 805 pounds; Sweden, 710 pounds; Australia, 633; United Kingdom, 611; Belgium-Luxemburg, 533; Germany, 483; Switzerland, 454; France, 410; The Netherlands, 395; and Russia, 342. Brazil, Chile, Peru and Venezuela completed the list at about 300 pounds per person.



Builders Hardware:

A growing industry profits from heavy postwar construction

THE PROGRESS of construction in 1953 will determine how builders hardware manufacturers will fare this year.

For two successive years, producers have enjoyed rising sales resulting from heavy industrial and civilian building. Currently residential building leads other types of construction in consumption of builders hardware. Now, manufacturers wonder if this year will be as profitable as 1952 when sales hit an estimated $220 million.

Construction Proceeds—A report by Evan J. Parker, president of the American Hardware Corp., New Britain, Conn., predicts that equipment sales for commercial buildings in 1953 should balance the 1952 level. While residential construction may drop slightly from 1.1 million starts in 1952 to about 850,000 in 1953—increased building of schools and hospitals should furnish a continuing demand for builders hardware.

From a meeting of the California Retail Hardware Association comes the report that hardware sales in that part of the country have gained substantially over sales one year ago, and the uptrend is continuing.

170 Producers — Hardware for building constitutes anything in equipment or metal parts used in operation of a door or window. Relatively few of the 170 companies making builders hardware produce the entire line, many manufacturing only two or three items. Locks are the largest category in dollar sales, accounting for about 35 per cent of the total.

Exposed parts of builders hardware are generally made of brass or bronze. Brass-plated steel is used in hinges, and steel is plated with cadmium for use in interior parts of locks. Aluminum has assumed greatly increased importance in the past five years. Yale & Towne Mfg. Co., Stamford, Conn., has begun production of a full line of builders hardware fabricated of that metal. Only since 1950 has aluminum come into use in locks.

New Developments — New in builders hardware is the use of cylindrical locks, with the keyhole in the knob. About 80 per cent of installations for residential housing take this type of lock, a postwar development. Cylindrical locks form a more compact unit and are installed more quickly than standard models.

Among special uses of builders hardware is controlling sliding doors, which are coming into increased use in modern housing. Another new device, for hospitals and schoolrooms, holds doors open at varying angles. Doors remain ajar until released by a slight push.

Supplies Improve — Material shortages are easing off now, manufacturers say. Aluminum had been in very short supply, and the industry felt the 1952 steel strike's effects severely long after it had ended. Contributing to industry optimism now is the promise of increased steel allotments in the second quarter of this year.

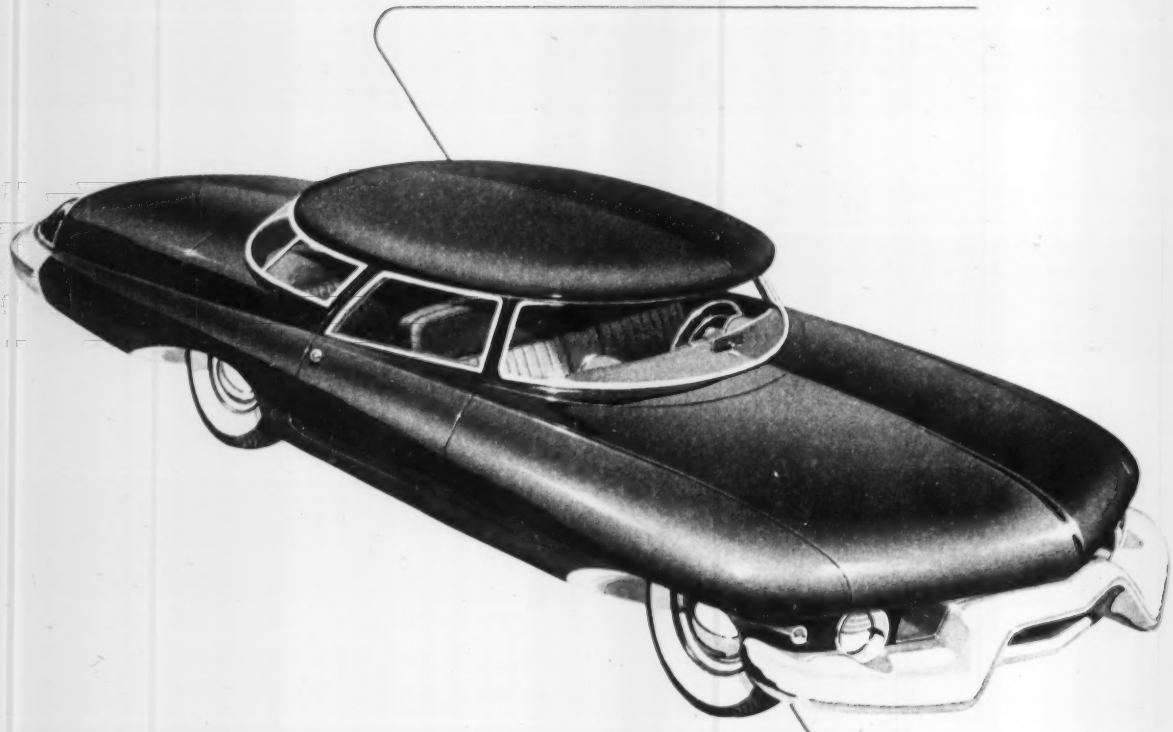
Industry members say they are getting more nearly the amount of steel they request now. Allocations to the hardware industry, during the final quarter, 1952, and the first quarter of this year had been at a lower rate than that previously enjoyed by manufacturers.

Problems still remain for the builders hardware industry in this period of high sales. If defense needs continue strong, civilian construction will lag. Costs, too, are a problem, and the accent currently is on mass production with a reduced number of standardized products.

Specify **N·A·X** HIGH-TENSILE STEEL for **Lighter Weight**

Longer Life

with Economy



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections — resulting in lighter weight of products. It is a low-alloy steel — possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel — resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

KEEP YOUR SCRAP MOVING TO YOUR DEALER

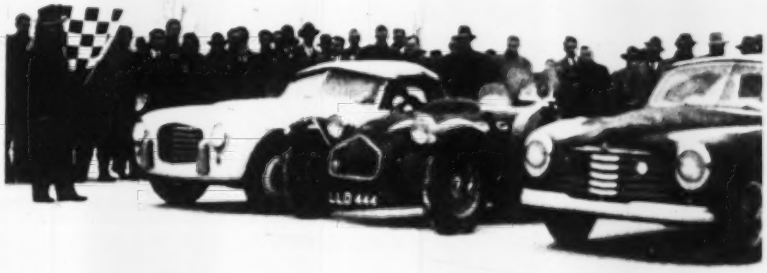
GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division • Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom



Sports car addicts gathered in a snowstorm raise the question . . .

Is the sports car just a fad for the hopelessly autoholic? Not entirely. The sports car presages new engineering concepts for more conventional models

DETROIT

WILL YOU BE buying a sports car? Detroit is pretty sure most of you won't, but it's equally sure sports cars will have to be made.

European sports car registrations in this country have more than doubled in the last three years and are still growing. Howard Darrin, who styled Kaiser-Frazer's new DKF-161 sports car, predicts that "the sky's the limit" for American-built sports cars. Student members of the Society of Automotive Engineers, Detroit Chapter, attended a program to see just what sports cars could do at the Ford test track and listened avidly to speakers on the subject during the day and evening.

Dim View—The automakers wish devoutly they'd never even heard of the words "sports car." Men that normally think in millions of units productionwise are being told to think in hundreds. Research departments are going berserk trying to figure out what demand is going to be. 100 might be too many, then again 100,000 might not be enough.

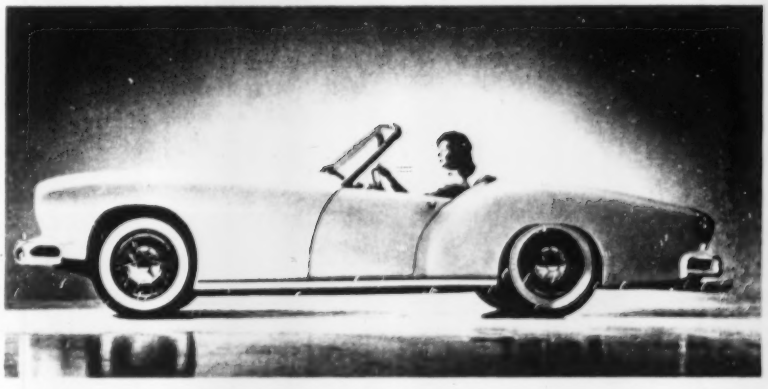
In some measure, the automakers themselves have engendered the sports car fad. They have found that nothing begets publicity like a nice, curvaceous "car of the future." Use of this gimmick started in the thirties and was continued after the war with such lovelies as Le Sabre, the XP-300 and the C-200. Ford even discovered that a clay model with the provocative title "195X" caused the same consumer drool as the real article, saved the cost of actually making the car by hand.

Publicity Gimmick—So when imported sports cars began scooting around the streets, automaker publicity men were quick to see the chance for another bit of this innocent sales bait. The sports car from Detroit was to be "every man's car of the future," and the future never quite arrives.

But when the cars went on display, the unexpected happened. A man with a wife and eight kids who ought to know better would look at the single-seated magic and casually announce, "I want one. . .now." That's how the public relations man's dream turned into the production man's nightmare.

Definition—Essentially, a sports car is an automobile designed for extremely high performance and excellent handling under extreme conditions. It has a low center of gravity, firm suspension, sensitive steering, remarkable brakes. It exudes automobile from the word go.

But there's a catch to the sports car. It is designed as a road machine first, and comfort and reliability, if they exist at all, are the last things considered. The manually erected top may be relied upon to shield the driver from near drowning, provided the drain plug on the floor is not clogged. Many sports cars are balky cold weather starters. Some overheat in traffic. Some have no adequate replacement parts supply. Some are critical as to tuning. Most have room for only two persons. And nearly all of them ride like coal trucks



Heralded by Kaiser-Frazer Corp. as the first automobile with a volume-produced plastic body, the DKF-161 has just been introduced as Kaiser-Frazer's bid for the sports car market. It will feature a reinforced fiberglass body, 100-horsepower engine with three carburetors, and three-position folding top

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when rambling over a corduroy road.

The Difference — Contrast this with the Detroit car and you'll see why the automakers are in a dither. The Detroit car starts with comfort, and performance becomes secondary just the converse of the sports car. This transportation device is made to be as much a house on wheels as is practical. The closer it resembles a living room in mobile state, the higher the price it brings. Those who cannot afford it will buy the next smaller.

In keeping with the resemblance to a small house, this vehicle must also act like one. It must be heated, cooled, aired, silenced and decorated to a high degree. The springing must be of such a nature that no jars, bumps or vibrations are felt. The center of gravity is wherever comfort in body design places it. The steering is made less sensitive to give lower wheel pressure.

Close Relations—It is this insulation between the driver and machine that typifies the American car, and it is intimacy with the machine that typifies the sports car. The sports car owner wishes to feel the master of a tight, concise bundle that is tops at its job. The typical American driver wishes to get from point A to point B as reliably and comfortably as possible. Both types of machine are superb at what they were designed to do.

One compromise answer to the production and demand problem is the modification of existing models along the lines of the Buick Skylark or the Cadillac Eldorado. But the sports car purist denounces "sports cars" of the wire wheel and notched door variety as not sports cars at all. Their performance is unchanged they just have a "sporty" look. Engineers and stylists of the auto companies are probably the largest foreign sports car-owning group in Detroit, and their comments about what sales and production men force them to do would blister a drawing board.

None From Detroit—At present there are no sports cars being produced in Detroit. Nash's sports car, the Nash-Healy, contains only one U. S. component the dual jet fire engine. Chassis are fabricated in England and the bodies are made in Italy. The units are assembled abroad. Selling for $5500, the cars were introduced in 1951 and to date only 125 are on the road a solid two hours' production by Detroit standards.

The only true American sports car being manufactured at the present time is the Cunningham, a product of Florida, not Detroit. Selling for about $10,000, probably less then 25 have thus far been built.

Coming—But a series of real Detroit sports cars may be just ahead, and they may go far toward bridging the gap between performance and comfort. Aluminum or plastic convertible tops that form a real coupe when erected are definitely in the offing. With a single seat the units can be engineered easily. American high-torque engines are already finding their place in sports cars throughout the world, notably the Cadillac, Chrysler and Lincoln Allards. And when the engineering has been completed, American production methods can build more sports cars more cheaply than it can be done anywhere in the world.

Even more promising is the effect that the sports car influence may have on the conventional passenger car of tomorrow. People who try to stay with an MG through a curve or accelerate with a Cad-Allard or brake as quickly as a Cunningham may call for those qualities from the Detroit car. Braking and suspension will definitely be the next two areas of advancement in the automotive field. Disc brakes seem assured of a trial. A solenoid mechanism to prevent wheel slide for quicker stops when braking is beyond the development stage. Better cooling to prevent brake fade will appear on 1954 models on a large scale.

Spheres of Influence—Centers of gravity will drop. Cadillac is rumored to be going to step-down design in 1954. Development of power steering promises a return to more sensitive steering ratios and greater safety while steering effort will be held low. Better weight distribution through smaller but equally powerful engines and greater utilization of aluminum appears definitely ahead. Driver controlled springing flexibility through shock absorber action adjusted from the dash board is coming back and should go far toward making a car stable on the open highway.

Experimentation in plastics for production of sports car bodies is resulting in development of techniques that could put plastics on many automobiles in the not too distant future. One of the big "B's" in body making is reported to be planning a plastic body plant soon.

The Real Thing — Detroit will produce some sports cars, real sports cars, in 1953. The Chevrolet Corvette should have 300 owners by the end of the year. The DKF-161 should go upwards of 1000. Production from all sources could reach 20,000 by the end of 1954. It may never go any higher.

But this much is sure: The influence of the sports car will be in your garage eventually. Its coming will be heralded by the advances in automotive engineering outlined briefly above. The American automobile of today has the speed of the sports car coupled with the comfort of a living room. It does not have the safety in suspension and braking to go with its high speed.

That is the lesson the sports car can teach, and it is a lesson that is rapidly being learned. Over the long pull it will be the lasting influence of the sports car on Detroit.

Auto, Truck Output

U. S. and Canada

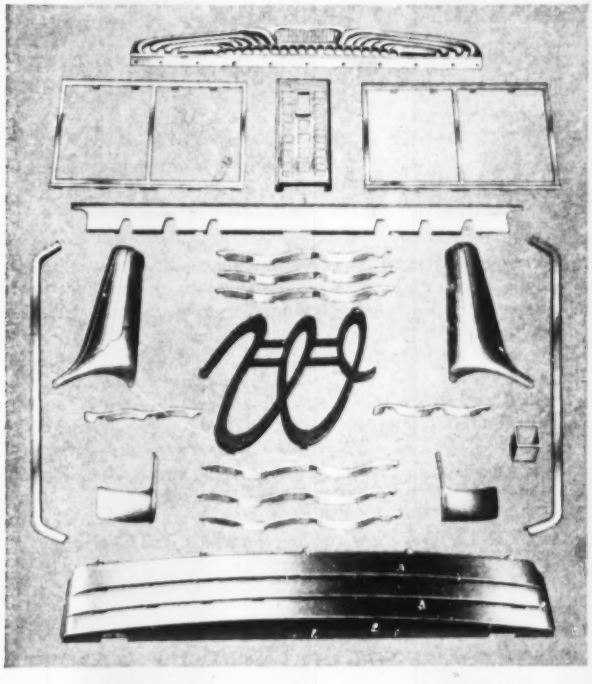
	1953	1952
January	613,517*	409,406
February		467,691
March		517,207
April		576,505
May		546,673
June		560,947
July		246,461
August		293,722
September		592,253
October		645,862
November		556,366
December		569,456
Total		5,981,626

Week Ended	1953	1952
Jan. 24	149,578	94,722
Jan. 31	150,289	102,402
Feb. 7	146,809	102,406
Feb. 14	147,103	111,821
Feb. 21	159,169	110,542
Feb. 28	155,000*	118,397

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

take a cue from the

WURLITZER 1500 -get the mo$t for your Zinc Die Ca$ting Dollar!



Your design and production problems may be far removed from those entailed in the engineering of a coin-operated phonograph, but the use of ZINC Die Castings in styling the new Wurlitzer 1500 model might well be your cue to important manufacturing economies.

Glance at any one of the phonograph trim castings pictured here and ask yourself how else it could be produced in the required shape, with close tolerances, with clean-cut reproduction of detail and with a surface which could be electroplated or painted at low cost. In many instances, these pieces have dimensionally accurate cast mounting elements and cored openings which mean that an absolute minimum of secondary operations are needed to prepare the castings for close-fitting assembly.

In ZINC Die Casting, the Wurlitzer engineers long ago found a metal and method of fabrication which offers complete freedom of design with impressive production savings. If *you* are not fully aware of the physical and economic advantages of ZINC Die Castings in product engineering it is suggested that you contact any commercial die casting company—or write to us.

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"Stop pulling my leg," Bill retorted skeptically.

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"RB&W's new SPIN-LOCK Screw," answered Bob. *"It has a patented feature — ratchet-like teeth under the head — that not only locks into the surface and holds tighter, but also speeds assembly. It does away with extra parts and special handling. Bet your switches could use 'em, Bill."*

MORAL: Look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New fasteners may prove more efficient than the ones you're now using. Or you may save by the stepped-up production you get from using the finest fasteners . . . RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

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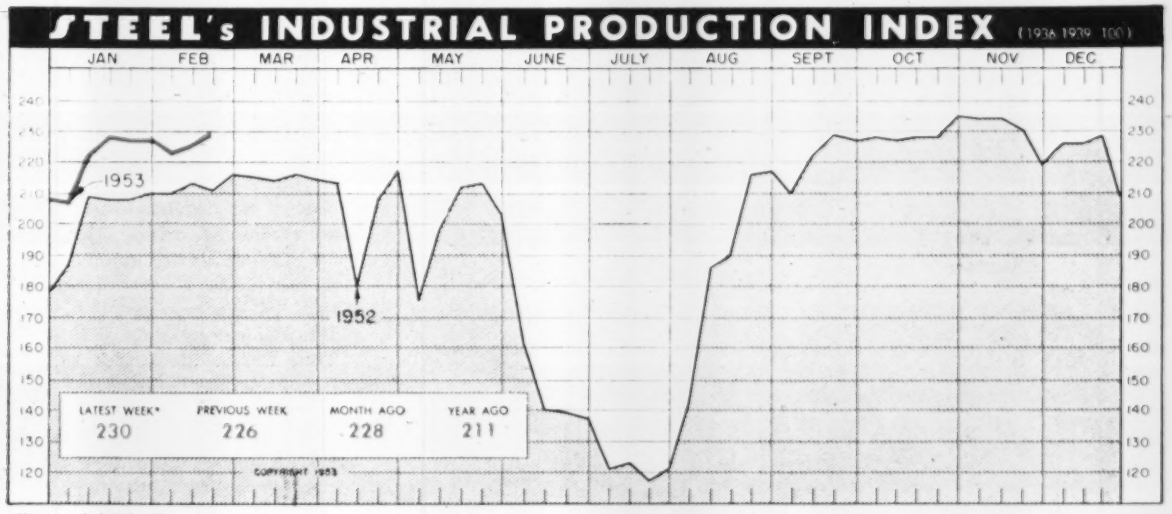
The Business Trend



*Week ended Feb. 21

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Wards' Reports) 20%.

Spring pick-up in most metalworking operations are expected in March. Steel and automotive output are already starting to climb again. Production index edges up

WATCH FOR a sharp upcurve in business activity this month. March is the traditional springtime month for pick-ups in industrial output, particularly in the metalworking industry. And March, 1953, as things look now, will probably follow this normal pattern of improvment.

Several prime indicators of production are already starting to move up from the high levels attained in January.

New High—Steel production, for instance, rose to 99.5 per cent of rated capacity in mid-January. In the next four weeks, production continued around this capacity rating. The leveling-out in steel operations halted in the week ended Feb. 21 when output rose to 100.5 per cent of capacity. This new high in weekly turnout may be sustained, or surpassed, during March.

The automotive industry is making an even more spectacular showing. U. S. companies in the week ended Feb. 21 boosted passenger car and truck operations to the highest level in 21 months. Car-truck production in March will probably continue to rise, since most automakers have completed their change-overs to new models.

Electricity production, a good indicator of industrial activity, started 1953 at around 7 per cent over the comparable weeks, a year earlier. Since mid-February, however, this gap has increased to around 9 per cent over a year ago despite mild weather in most parts of the U. S. Power output in March will probably continue well over the comparable weeks in 1952.

Freight car loadings in 1953, on the other hand, have continued to lag about 5 per cent under the year-ago weekly figures. Most of the decline is due to a drop in shipments of farm products, however.

Index Moves Up—Mirroring the rise in industrial activity, STEEL's production index in the week ended Feb. 21 climbed 4 points to 230 per cent of the 1936-1939 average. This marks a 19 point rise from the index reading for the comparable 1952 week. The Feb. 21 index is only 5 points under the postwar high attained in October.

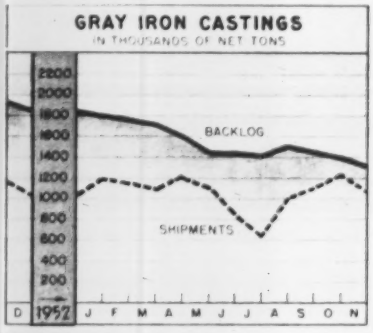
Steel Output Heavy . . .

The steel industry is continuing to operate at full tilt as demand holds firm for most of its products. The American Iron & Steel Institute estimates that U. S. mills in the week ended Feb. 28 produced 2,244,000 net tons of steel for ingots and castings.

High Production in Autos . . .

The automotive industry is staging a big production push to build 3.2 million U. S. passenger cars in the first six months of 1953. So says *Ward's Automotive Reports*, which adds that short receipts of steel could easily upset this projection. But if this goal is attained, the industry will have rolled out the best output for any six months since 1934. Closest approach since 1934 to 3.2 million assemblies occurred in 1951 when 3,109,000 passenger vehicles were manufactured in the first six months by U. S. automakers.

U. S. and Canadian companies in the week ended Feb. 21 shoved assemblies to 159,169 passenger cars and trucks, more than 12,000 units over the previous week and a whopping advance over the 110,542 completions in the comparable week of 1952. Combined U. S. and Canadian car-truck output in 1953 by Feb. 21 reached 1,067,447 vehicles, compared with only 767,941 assemblies in the same weeks of 1952. In the week ended Feb. 28, STEEL estimates that 155,000 pas-

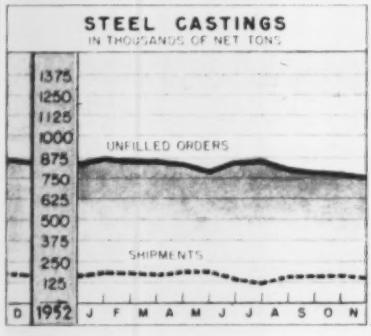


Gray Iron Castings

Thousands of Net Tons

	Shipments		Backlogs*	
	1952	1951	1952	1951
Jan.	1,969	1,364	1,801	2,298
Feb.	1,155	1,234	1,766	2,392
Mar.	1,472	1,440	1,711	2,390
Apr.	1,205	1,363	1,614	2,337
May	1,101	1,396	1,459	2,229
June	835	1,309	1,445	2,162
July	636	1,029	1,410	2,208
Aug.	1,002	1,219	1,513	2,145
Sept.	1,119	1,115	1,451	2,055
Oct.	1,233	1,302	1,392	1,983
Nov.	1,061	1,184	1,309	1,934
Dec.		1,032		1,847
Total		13,768		

* For sale. U. S. Bureau of the Census.

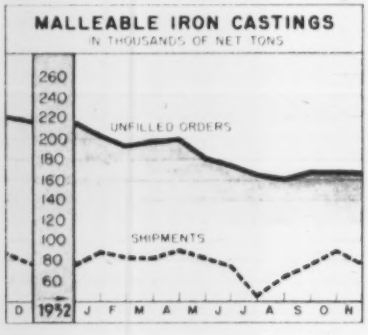


Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1952	1951	1952	1951
Jan.	183.7	174.1	869.3	675.4
Feb.	174.6	164.0	856.9	767.4
Mar.	173.7	190.7	857.1	778.7
Apr.	175.1	181.9	843.0	846.9
May	173.6	189.2	804.7	881.7
June	141.6	184.7	846.5	895.1
July	119.0	147.2	855.0	930.0
Aug.	150.2	177.1	809.4	944.2
Sept.	158.4	160.7	781.9	918.0
Oct.	165.2	189.9	772.9	891.5
Nov.	148.3	176.7	751.7	865.0
Dec.		165.1		846.4
Total		2,093.3		

* For sale. U. S. Bureau of the Census.

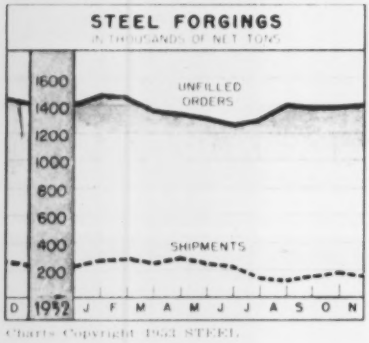


Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1952	1951	1952	1951
Jan.	87.0	92.5	201.0	234
Feb.	82.9	84.0	193.1	255
Mar.	81.0	101.7	196.9	267
Apr.	80.3	97.3	198.2	276
May	81.8	100.8	180.4	275
June	74.4	91.7	173.4	256
July	45.3	76.8	166.6	263
Aug.	63.7	90.7	162.8	249
Sept.	75.9	82.3	168.4	245
Oct.	88.1	93.9	168.6	238
Nov.	76.1	88.2	167.8	221
Dec.		76.0		215
Total		1,082.9		

* For sale. U. S. Bureau of the Census.



Charts Copyright 1953 STEEL

Steel Forgings

Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan.	271*	138	1,472*	709
Feb.	272*	129	1,464*	781
Mar.	266*	161	1,366*	875
Apr.	272*	154	1,349*	924
May	263*	266*	1,319*	1,208*
June	224*	249*	1,248*	1,264*
July	142*	220*	1,280*	1,361*
Aug.	121*	246*	1,399*	1,436*
Sept.	150*	225*	1,392*	1,419*
Oct.	178*	280*	1,393*	1,427*
Nov.	156*	256*	1,388*	1,446*
Dec.		232*		1,411*

U. S. Bureau of the Census. *Data for these months based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more. Previous data based on reports from commercial forge shops producing 3600 tons or more per year.

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 23	Gear Sales	Jan. 26	Ranges, Elec.	Feb. 2
Durable Goods	Jan. 18	Indus. Production	Feb. 16	Ranges, Gas	Feb. 23
Employ., Metalwkg.	Jan. 18	Ironers	Feb. 9	Refrigerators	Feb. 2
Employ., Steel	Dec. 15	Machine Tools	Feb. 9	Steel Shipments	Nov. 3
Fab. Struc. Steel	Feb. 9	Prices, Consumer	Jan. 26	Vacuum Cleaners	Feb. 9
Foundry Equip.	Feb. 16	Prices, Wholesale	Jan. 26	Wages, Metalwkg.	Jan. 26
Freight Cars	Feb. 16	Pumps	Feb. 16	Washers	Feb. 23
Furnaces, Indus.	Feb. 2	Radio, TV	Feb. 2	Water Heaters	Feb. 23

senger cars and trucks were produced by U. S. and Canada.

Fewer Locomotives Installed . .

Indicating that many railroads may be near the end of their dieselization programs, installation of new locomotives are about 50 per cent under a year ago. The Association of American Railroads says that Class I railroads in January put in service 162 new locomotives, of which 161 units were diesel-electric. In the same month in 1952, these railroads installed 337 locomotives, of which all but two were diesels.

Class I railroads on Feb. 1, 1953, had 962 locomotives on order, including 919 diesel-electric units. A year earlier, 2022 new locomotives were on order, of which diesels accounted for 1993 units.

Refrigerator Sales Level Out . .

Makers of electric refrigerators may be finding that demand may soon level out for their products. These manufacturers in the final six months of 1952 boosted output to meet a recurrence in consumer demand. Towards the end of the year, however, the upward momentum in refrigerator output showed signs of losing strength. The National Electrical Manufacturers Association says that production of refrigerators in November reached a nine-months' peak of 256,530 units. Factory sales of refrigerators in December declined to 248,506 units—perhaps only indicating a slowing of the upward trend, since December was a short work-month.

Factory sales of ranges, on the other hand, were still climbing rapidly at year-end. Range sales in December climbed 11,648 units to 84,630 units, the highest range volume in six months.

Failures Down, Liabilities Up . .

Failures of manufacturing and mining companies in January dropped more than 9 per cent from the same 1952 month, but liabilities involved rose 10 per cent over a year earlier. Manufacturing and mining failures in January totaled 130 enterprises, compared with 143 in January, 1952, says Dun & Bradstreet Inc. Liabilities of these com-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.5	99.5	100.0
Electric Power Distributed (million kwhr)	8,130[1]	8,147	7,461
Bituminous Coal Output (daily av.—1000 tons)	1,391	1,422	1,766
Petroleum Production (daily av.—1000 bbl)	6,550[1]	6,544	6,366
Construction Volume (ENR—millions)	$144.1	$267.8	$222.1
Automobile, Truck Output (Ward's—units)	159,169	147,103	110,542
TRADE			
Freight Car Loadings (unit—1000 cars)	680[1]	682	683
Business Failures (Dun & Bradstreet, number)	160[1]	200	177
Currency in Circulation (millions)[3]	$29,654	$29,776	$28,387
Dept. Store Sales (changes from year ago)[4]	+3%	+1%	−12%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,520	$15,495	$18,459
Federal Gross Debt (billions)	$267.4	$267.4	$260.1
Bond Volume, NYSE (millions)	$16.6	$11.4	$11.6
Stocks Sales, NYSE (thousands of shares)	6,630	5,718	6,634
Loans and Investments (billions)[4]	$76.9	$77.0	$73.7
United States Gov't. Obligations Held (billions)[4]	$31.3	$31.4	$32.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	210.7	210.7	243.6
All Commodities[7]	109.5	109.4	113.0
All Commodities Other Than Farm and Foods[7]	112.8	112.7	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953—2,254,450; 1952—2,077,610. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

panies in January reached $9.1 million, compared with $8.3 million a year earlier. Failures among iron and steel producers and fabricators totaled nine firms, compared with four in January, 1952. Liabilities of these companies reached $1.6 million, compared with only $110,000 in liabilities in January, 1952.

Failures among producers of machinery totaled 13 firms, the same number as in January, 1952. Liabilities in this industry division dropped to $1.1 million from $2.5 million in the same 1952 month.

Only two failures occurred in January in the transportation equipment industry; a year earlier, the number was seven mortalities. Liabilities in this category in January, 1953, dropped to $44,000 from $344,000 in January, 1952.

Big Market for TV . . .

TV set makers have a long way to go before even their present market areas near saturation. Radio-Television Manufacturers Association, after surveying areas serviced by TV stations, reports that 47.35 per cent of the homes with radios have TV sets. This percentage may drop in the next few months, as new areas are serviced by TV channels. In May, 1952, only 100 television stations were operating in the U. S. Since then, the Federal Communications Commission has authorized construction of 139 more stations, a number of them in new areas for TV.

Securities Sales Hit Peak . . .

The Securities & Exchange Commission reports that corporations in 1952 offered more new securities for sale than in any other year since 1929. In 1952, new securities offered for cash sale, including both new money and refunding issues, amounted to $9.7 billion, up 25 per cent from 1951.

Large-scale capital expansion programs were mostly reflected in the large volume of funds raised. Of total net proceeds obtained in the securities market, $8.3 billion, or 87 per cent, was for new money purposes including $6.4 billion for new plant and equipment and $1.9 billion for working capital.

Trends Fore and Aft . . .

Production of truck trailers in 1952 totaled 58,077 units, or 14 per cent under 1951 output . . . Consumption of natural rubber in January rose 28.6 per cent over January, 1952 . . . Manufacturers of standard vacuum cleaners in January sold 255,886 units, an up of 11 per cent from January, 1952.

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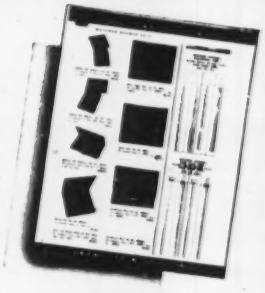

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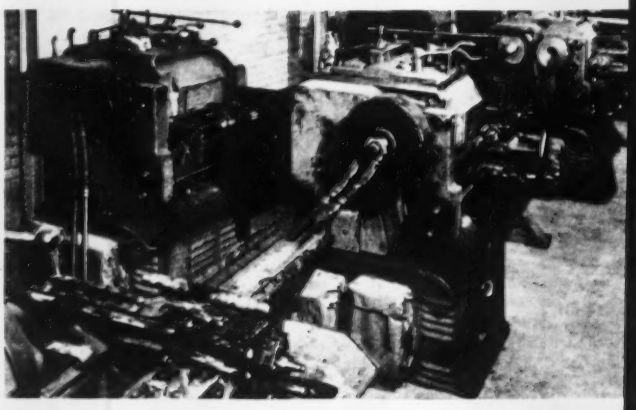
DEFENSE PLANT DE-MOTHBALLED FAST WITH THE HELP OF TWO SUN PRODUCTS

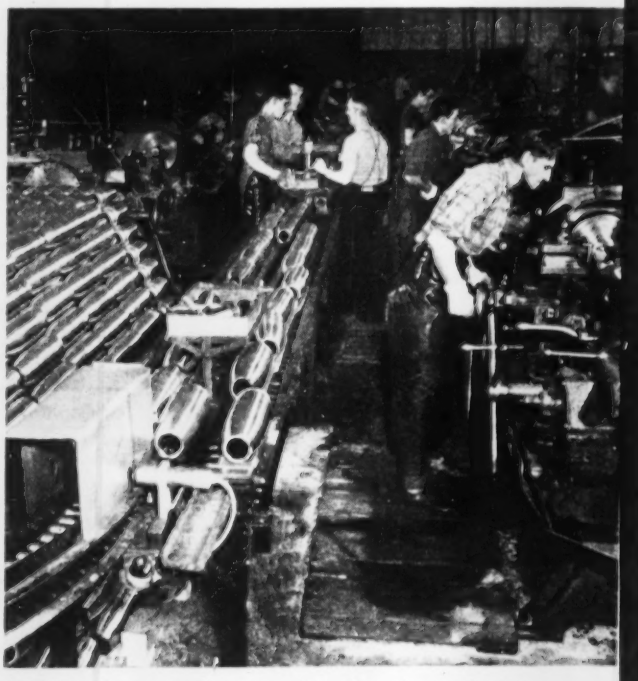
Recently the U. S. Hoffman Machinery Corporation was asked to reopen a World War II Navy-owned shell-making plant and start production in three months. The machinery, idle for 5 years, had been protected by an external layer of rust preventive. Headstocks, gear units and hydraulic lines were among the parts coated, and unfortunately some of the protective material had seeped into them. It looked as if the machinery might have to be torn down to be cleaned.

Hoffman invited Sun and several other oil companies to survey the machinery and suggest cleaning methods. The company chose Sun's recommendations on the basis of their soundness, as well as on Sun's record for reliable service in other Hoffman plants. The Sun products used eliminated the need for any dismantling. Sun Spirits did the external cleaning job. Sunvis H.D. 700 Oils freed up the hydraulic systems, many of which were extremely sluggish; the detergency of these oils flushed away every last trace of sludge and rust preventive.

Throughout the entire cleaning and recharging process, Sun representatives stayed on the job. As part of Sun's regular service, they trained the oilers, helped work out an inventory control system, and set up lubrication schedules. The terms of the Navy contract were met, and vital defense production was started on schedule. In the year and a half that has since elapsed, there have been no machine failures traceable to poor lubrication.



BEFORE: The machinery in this Navy-owned shell-making plant stood idle—coated with a rust preventive—for 5 years after World War II. When asked to reactivate the plant in three months, the U. S. Hoffman Machinery Corporation anticipated a complete machinery teardown for cleaning, because the rust preventive had seeped into the working parts.



AFTER: No teardown was needed. Sun Spirits did the external cleaning job and the detergency of Sunvis H.D. 700 Oils the internal job—cleaning out parts and freeing hydraulic systems. Thanks to the effectiveness of these products, the job was completed and the plant put in operating condition within the three months specified by the Navy.

SUN OIL COMPANY, Dept. S-3
Philadelphia 3, Pa.

☐ I would like to consult with a Sun representative.

☐ Please send me a copy of "Sunvis H.D. 700 Oils."

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

TECHNICAL ASSISTANCE AVAILABLE. Sun's engineers are at your service for consultation on any matters concerning hydraulics, lubrication or metalworking. It will pay you to utilize the broad experience they have gained in solving a wide variety of lubricating and processing problems in many different industries.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO

Men of Industry

GEORGE W. URBAN
. . . Cleveland Crane purchasing agent

KNEELAND NUNAN
. . . exec. V. P., Consolidated Vacuum

HILTON J. LAFAYE
. . . div. mgr. at Goodyear

George W. Urban was appointed purchasing agent of **Cleveland Crane & Engineering Co.**, Wickliffe, O., to succeed **Henry Karr**, who retired. Mr. Urban was assistant purchasing agent for the last seven years.

Hapman-Dutton Co., Kalamazoo, Mich., appointed **William H. Phillips** vice president in charge of production. Formerly assistant to the president of Hein Werner Corp., he was responsible for manufacturing, engineering, purchasing and its sales development programs.

Harold E. Lee succeeds the late **Alfred G. Mohrman** as New York district sales manager for **Bridgeport Brass Co.**

J. T. Hassett was appointed to the newly created position of assistant general superintendent of **Bristol Brass Corp.**, Bristol, Conn. He continues to supervise the time study and methods department.

William L. Manly was named assistant director of sales, general machinery division, **Allis-Chalmers Mfg. Co.**, Milwaukee. Newly named sales representatives for the division are **John G. Christfield Jr.**, **Duke R. Silvestrini** and **Elbert R. Nuttle Jr.**, assigned in the Atlantic section; **John A. Brown Jr.** and **Donald L. Fitzsimmons** in the Knoxville and Louisville districts.

Kneeland Nunan was elected executive vice president and member of the board of directors of **Consolidated Vacuum Corp.**, Rochester, N. Y., newly acquired subsidiary of Consolidated Engineering Corp., Pasadena, Calif. Formerly vice president in charge of sales at Consolidated Engineering, Mr. Nunan replaces **Hugh F. Colvin** at the Rochester operation. Mr. Colvin, recently promoted to vice president and treasurer of the parent company, returns to Pasadena. He continues to serve as treasurer and a director of the subsidiary.

Walter E. Peters was named director of purchases by **Lakeside Bridge & Steel Co.**, Milwaukee. He has been purchasing agent for 29 years.

E. D. Powers is president of **Chemical Construction Corp.**, subsidiary of American Cyanamid Co., New York. He succeeds **Maj. Gen. William N. Porter**, now chairman of the board. Mr. Powers remains as vice president and director of the parent firm.

Vinson Sahlin was named chief industrial engineer for **Heil Co.**, Milwaukee, responsible for all functions of the industrial engineering division. He formerly was with Illinois Tool Works in a similar capacity.

Hilton J. Lafaye, sales manager of **Goodyear Tire & Rubber Co.'s** rim division since 1951, was named general manager of the company's metal products division, formerly the rim division, in Akron.

James E. Krajovic was appointed purchasing agent of the Brosius Division, **Salem-Brosius Inc.**, Pittsburgh, succeeding **Alfred G. Lewis**. He will be located in Salem, O., where the purchasing, engineering, and accounting function of the Brosius and sales engineering divisions have been consolidated.

Promotions at the pump division, **Eaton Mfg. Co.**, Marshall, Mich., include **W. Ross Eames** to assistant to general manager, **Louis A. Selin** to assistant sales manager, **Nicholas A. Noreyko** to assistant chief engineer and **Richard H. Berge** to assistant plant manager.

John H. Kilmer Jr. was appointed chief engineer and **Paul A. Brauer** assistant chief engineer in charge of production of **Golden-Anderson Valve Specialty Co.**, Pittsburgh.

Divisional assignments in the sales department of **Heppenstall Co.**, Pittsburgh, include **J. O. Phillips**, named assistant to the general manager of sales; **R. B. Heppenstall Jr.** appointed manager of market research; **Harold F. Wood Jr.**

F. STEELE BLACKALL III
. . . asst. gen. mgr. at Taft-Peirce

JOHN ARNOLD
. . . Lee Wilson Eng. chief engineer

PAUL McVICKER
. . . Electro Metallurgical tech. director

as manager of knife sales; and **Ward E. Duchene** as manager of materials handling sales.

F. Steele Blackall III was appointed assistant general manager, **Taft-Peirce Mfg. Co.**, Woonsocket, R. I. He also is assistant treasurer and a director. For some time he has served as assistant superintendent of the contract division.

Edward H. Platz Jr., manager of alloy sales, **Lebanon Steel Foundry**, Lebanon, Pa., returned to his post after serving the National Production Authority as nickel specialist, Iron & Steel Division.

Orren R. McJunkins was named general manager, southeastern district, metal division, for **Continental Can Co.** He will have headquarters at Baltimore.

At the aircraft engine division, Chicago, **Ford Motor Co.**, **A. C. Moore** was made general manager. He joined the company in 1919, became the first general manager of the company's tank division and last November became general manufacturing manager of the aircraft engine division. **C. O. Slaght** was made assistant general manager; **E. P. Gallagher** general purchasing agent; and **R. A. Powley** assistant general manufacturing manager.

W. Orville Wilson was made purchasing agent, **Atkins Saw Division**, Borg-Warner Corp., Indianapolis. He succeeds **W. N. Springer**, retired.

John Arnold advances to chief engineer at **Lee Wilson Engineering Co. Inc.**, Cleveland. He succeeds **Vernon L. Miller**, appointed eastern district manager with headquarters in the New Haven, Conn., area.

Maynard T. Murray was appointed to the new post of vice president in charge of manufacturing for **Independent Pneumatic Tool Co.**, Chicago. He has been general manager of Ford Motor Co.'s aircraft engine division in Chicago since 1950.

Victor Brown was elected a vice president, **Kropp Forge Co.**, Chicago. Formerly assistant to the president, he joined the company in 1942 as chief metallurgist and became technical director in 1945.

VICTOR BROWN
a V. P. of Kropp Forge

Paul McVicker was appointed technical director of operations, **Electro Metallurgical Co.**, a division of Union Carbide & Carbon Corp., New York. His headquarters will be in Niagara Falls, N. Y., at which plant he has been in charge of the technical control and activities.

Edmund T. Morris was appointed assistant manager of **Westinghouse Electric Corp.'s** atomic power division, Pittsburgh.

Leslie E. Baker is manager of **Fruehauf Trailer Co.'s** branch at Toledo, O. For the last few years he has been sales manager, Kansas City branch.

Joseph B. Stazinski was named manager of **General Electric Co.'s** Everett and Lynn, Mass., foundries. Concurrently **J. E. Waugh**, **L. A. Dunn** and **R. H. Roberts** were named managers of the foundry operations at Schenectady, N. Y., Erie, Pa., and Elmira, N. Y., respectively.

R. L. Hanes was appointed assistant to the vice president-sales at **Colorado Fuel & Iron Corp.**, Denver.

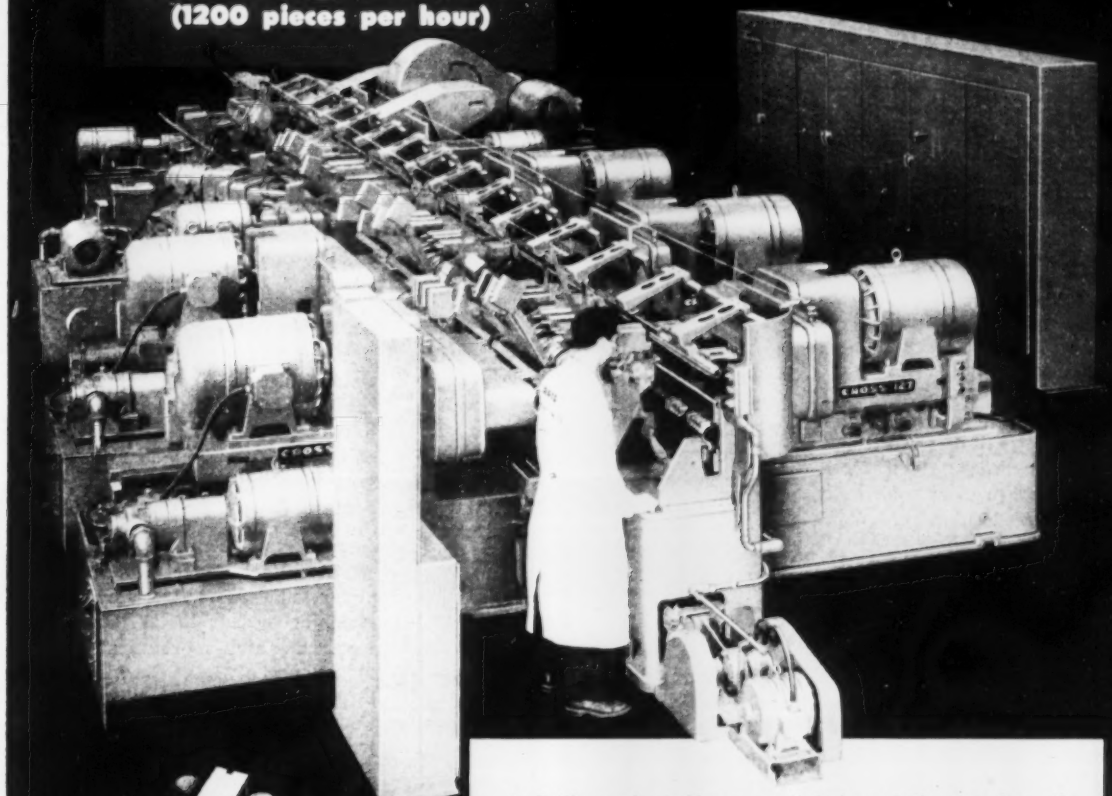
Air Associates Inc., Teterboro, N. J., manufacturer of aircraft parts and special purpose electronic supplies, elected **J. E. Ashman** president and a director. He previously was executive vice president of Rockwell Mfg. Co.

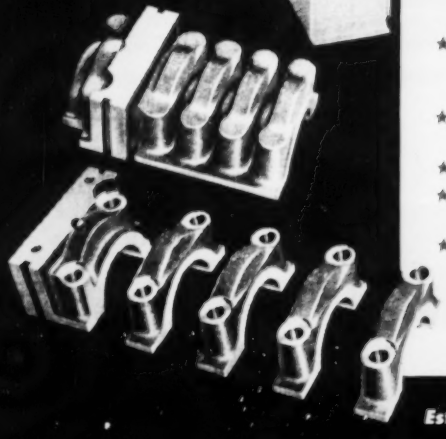
Theodore L. Pantz becomes vice president in charge of manufac-

Mills, Drills, Spotfaces and Taps Bearing Blocks

(1200 pieces per hour)

Another Transfer-matic by Cross





- ★ Drills and spotfaces stud holes; drills angular oil hole; drills and taps two screw holes; mills bearing lock slots; and saws into five individual pieces.
- ★ 240 bearing block sets (1200 pieces) per hour at 100% efficiency.
- ★ Capacity for machining two sets of parts at a time.
- ★ Two heavy-duty, 25 hp, vee belt drive, milling spindles for sawing operations.
- ★ Other features: Built-in chip conveyor, automatic lubrication, overhead transfer mechanism, gravity operated cam clamping for work holding fixtures, J.I.C. hydraulic and electrical construction.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

HENRY S. ELDER
. . . Titeflex exec. V. P.

GEORGE K. LICHT
. . . V. P.-production at Titeflex

JOHN J. PHILLIPS
. . . V. P.-sales & eng. at Titeflex

turing for **Servel Inc.**, Evansville, Ind.

Neil A. Moore was appointed executive vice president, **Copco Steel & Engineering Co.**, Detroit. He formerly was president of F. L. Jacobs Co., and prior to that a vice president of Federal Mogul Corp.

Richard L. Russell is industrial control sales manager, **Square D Co.**, Los Angeles. He succeeds **Daniel H. Miller**, now in Seattle as district manager of the Pacific Northwest.

John F. Maisch was elected treasurer of **E. F. Houghton & Co.**, Philadelphia. He has been controller since 1950.

Wagner Bros. Inc., Detroit, added three sales representatives to service the eastern Michigan territory which includes Detroit and Toledo, O. They are **Larry Glynn, Henry Pfeuffer** and **Herb Marx** who will locate at the home office in Detroit. **Bert Hawhee** is sales representative for the Indiana territory and is located in the newly established office at 3016 N. Illinois St., Indianapolis.

Titeflex Inc., Newark, N. J., promoted **Henry S. Elder** to executive vice president, **George K. Licht** to vice president in charge of production at its two plants in Newark, and **John J. Phillips** to vice president in charge of sales and engineering. Mr. Elder has served as vice president since joining the firm in 1946. Mr. Licht has been works manager and Mr. Phillips chief engineer.

Gerald E. McEvoy was named director, vice president and treasurer of **Pacific Tube Co.**, Los Angeles. He was formerly treasurer and assistant secretary. **Kenneth M. Sime** and **M. J. Johnson** were named assistant secretaries and assistant treasurers.

Richard F. Batchen joined **Unarco Steel Buildings Division**, Union Asbestos & Rubber Co., Chicago, as an engineer. For several years he has been research engineer at the Buffalo plant of Detroit Steel Products Co.

Walter A. Sheaffer II was elected president, **W. A. Sheaffer Pen Co.**, Ft. Madison, Iowa. He succeeds his father, **Craig Sheaffer**, who resigned as president to become assistant secretary of commerce in the new administration. **John D. Sheaffer** was elected to the board and named to the executive committee to replace the new president.

Purchasing agents appointed by **United States Steel Corp.**, Pittsburgh, include **R. M. Brown**, iron and steel scrap; **W. W. Crawford**, electrical and mechanical equipment; and **R. D. Crowley**, construction materials and services. For the latter, **R. F. Dyson** and **R. J. MacKenzie** are assistant purchasing agents.

E. F. Mitchell was made Detroit district manager, **Simonds Abrasive Co.**

Richard F. Walz was appointed sales and engineering aide to the assistant general manager, computer division, **Bendix Aviation Corp.**, Los Angeles.

A. O. Smith Corp., Milwaukee, announces opening Mar. 1 at Oakland, Calif., of a new service branch of

(*Please turn to Page* 122)

OBITUARIES . . .

Raymond H. Rauen, 52, general manager for **U. S. Spring & Bumper Co.**, Los Angeles, died Feb. 6.

Frank E. Flynn, 68, a district manager since 1905 of **Republic Steel Corp.**, died at his home in Youngstown Feb. 19. He had been assistant vice president of Trumbull Steel Co. which was absorbed by Republic in 1928.

Stanley A. Day, 81, former president, **S. A. Day Mfg. Co. Inc.**, platers' supplies, Buffalo, died Feb. 12.

Nelf K. Anderson, 53, president, **Alloy Steel & Metal Co.**, Los Angeles, died Feb. 6.

Mark A. Robin, 65, president, **Seaboard Engineering Corp.**, Los Angeles, died Feb. 11.

5 MINUTES PER PIECE WITH THIS VERSATILE NEW CH MILLING MACHINE

Speeds fabrication of aircraft parts from 75ST aluminum alloy

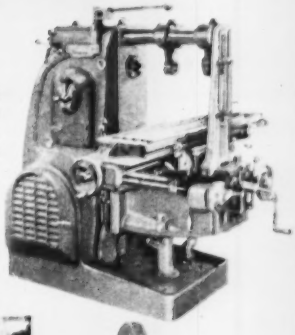
HERE ARE THE FACTS ON THIS JOB:

Location:	Mar Vista Engineering Co., Los Angeles, Calif.
Machine:	5 hp, No. 2, Model CH, Plain Style used with Universal Milling Attachment.
Part:	Aircraft fitting for horizontal stabilizer.
Material:	75ST aluminum alloy.
Cutter:	One blade — 8" fly cutter.
Cutter Speed:	875 rpm, 9 ipm feed.
Depth of Cut:	.050".
Production:	12 pieces per hour — all sides milled.

INVESTIGATE the versatile new CH line of milling machines. Their features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

CH MILLING MACHINE FEATURES THAT HELPED INCREASE OUTPUT — CUT COST PER PIECE

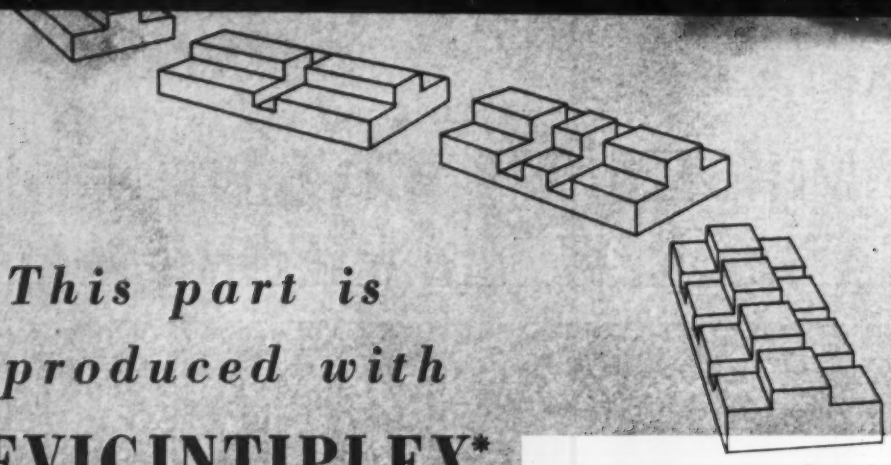


5 hp No. 2 MODEL CH Plain Style Milling Machine.

Smoother feed performance through a heavy duty 2" dia. table feed screw. 23% greater bearing contact between screw nut for longer screw life and accuracy.

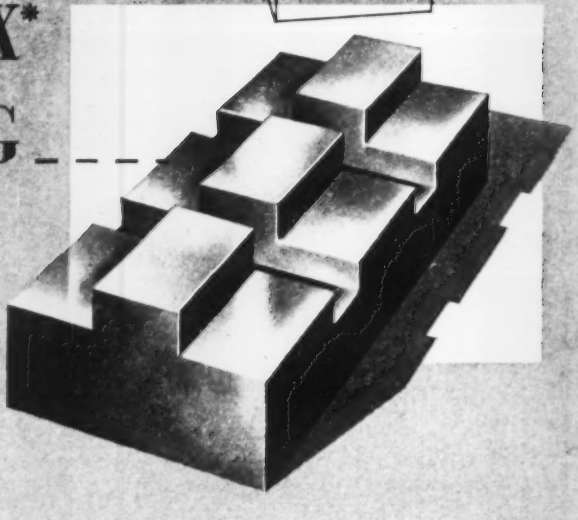
Greater cutting efficiency — design refinements in 3-bearing spindle and a train of heavy duty, wide-faced, forged steel gears, hardened and specially processed.

Speed range—16 speed changes are provided from 25 to 1500 rpm. *Extra-wide feed range*—16 changes from ¼" to 12" per minute meet requirements of new metals and cutting tools.



This part is produced with

UNDEVIGINTIPLEX* BROACH TOOLING



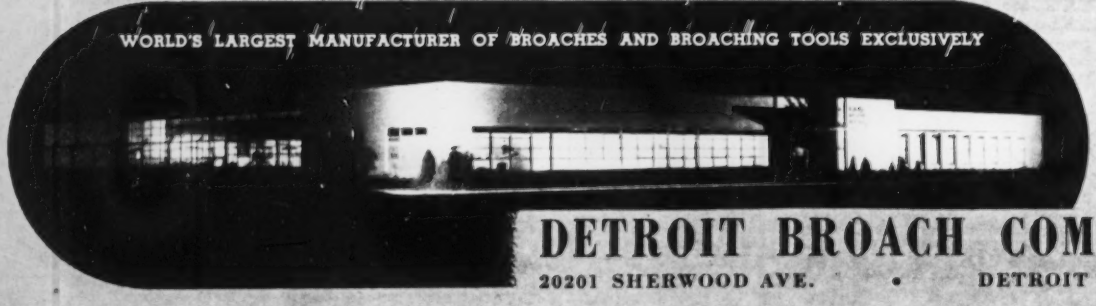
* *to have nineteen-fold use*

A metal parts manufacturer recently asked Detroit Broach for broach tooling which could produce 19 different sizes of a similar part. Because production of each size was low, it was essential that a universal tooling set-up be created to realize the full economies of broaching.

The problem involved the broaching of a tongue and one, two or three cross slots in the metal parts which varied in width and length.

Detroit Broach engineers tackled the problem and came up with undevigintiplex tooling. Two stations were provided on a 25-ton single ram vertical broaching machine to broach the tongue and the cross slots. To take up for the variation in the cross slots of the 19 different sized parts, spacers were used between the broaches. And for the differences in width and length of the parts, inserts were used in the workholding fixture. Result . . . 19 different sized parts produced in a single tooling set-up!

This is just typical of the economies that can be had through universal broach tooling when a number of similar low production parts are needed by manufacturers. You, too, may have an application that can be materially reduced in time or cost by the economy of broaching. It will pay you to consult Detroit Broach for engineering or production data.



DETROIT BROACH COMPANY

20201 SHERWOOD AVE. • DETROIT 34, MICH.

Production AND Engineering NEWS AT A GLANCE

NEW TREND—The arc furnace appears to be emerging as a definite competitor of the open hearth in production of low carbon steel. Sixty years ago, almost 90 per cent of the total steel produced in the U. S. was made by the Bessemer process and the open-hearth accounted for roughly 10 per cent. At the present time, according to Battelle Memorial Institute, about 88 per cent of the total steel output is produced by the open-hearth, about 5 per cent by the Bessemer, and about 7 per cent by the arc-furnace. Conceivably, within the predictable future, history may repeat itself, and the arc furnace may replace the open hearth as the major producer of steel.

IMAGE OF PERFECTION—When it comes to a grinding job where fine finish is mandatory, Bryant Chucking Grinder Co., Springfield, Vt., speaks with authority. Support for their claim on the importance of machine alignment is gained every day in their plant. In a room where the temperature is held at 68° (even the machine's oil is temperature controlled) they grind ring gages, for example, for use in their own shop. With a 60 grit wheel the surface is rough ground. This same wheel then goes back over the surface for the finish grind. Result—a finish of better than 1 microinch rms, a real mirror surface.

PRACTICAL ATOMICS—Considering the amount of publicity atomic energy developments are receiving, there is little practical information pertaining to peacetime industrial applications. So far the most advanced projects are concerned with atomic energy in a heat-to-steam-to-electricity chain. Two submarine propulsion projects are the first of a series of marine installations and information collected on these two jobs will undoubtedly establish how far it is practical to go in other directions. Included in "The Facts About Atomic Power in Industry" are examples of industry's atomic experience to date, ideas on how to get into the program and a forward look as to the probable avenues that industry may take. p. 86

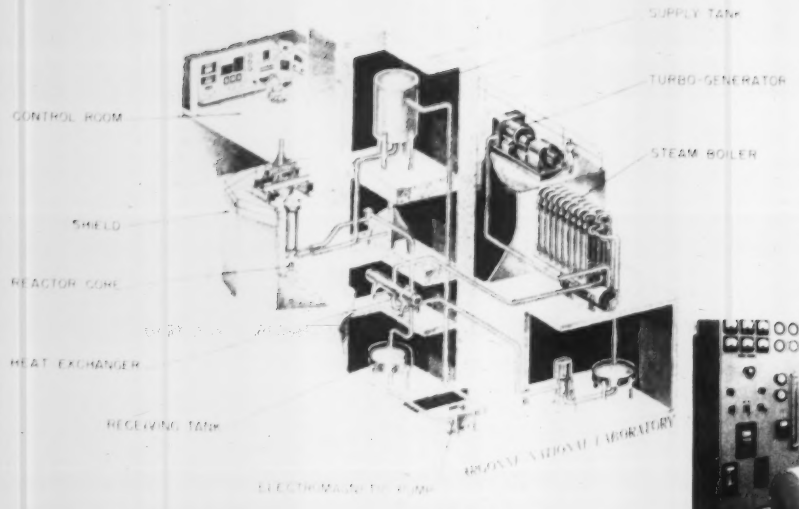
EXTRUSION WITH SCRAP GLASS—Latest tack taken by some of the companies using the Ugine-Sejournet extrusion process is to substitute ground glass for some of the fiberglass used. Ground glass is sprayed inside the hole punched in the heated billet and on its exterior. Tests so far indicate this technique is comparable to the former method and at a lower cost. At least for the present, the fiberglass cartridge placed inside the die can now be replaced. Supply is no problem as junk dealers can supply bottles in the broken and unbroken state far in excess of requirements. A producer of the ferrous extrusions and a glass company are investigating further. They want to see whether higher quality glass specially designed for the job will have any beneficial effect on production.

DIE IRON—Nickel-alloyed acicular cast iron used for metal forming dies has produced up to 3 million stampings for a utensil manufacturer. Peal Mfg. Co., Cincinnati, had its dies made by Chris Erhart Foundry & Machine Co. of the same city for a variety of stampings made from aluminum and tin plate. The dies contain 1 per cent molybdenum and from 1.5 to 3.5 per cent nickel depending on the section thickness. The method of alloying according to section size produces mechanical properties of 60,000 psi minimum tensile strength and Brinell hardness in the order of 265 275. Reduction in machining requirements over former die materials used, easier machining and lower initial costs are advantages cited by the manufacturer.

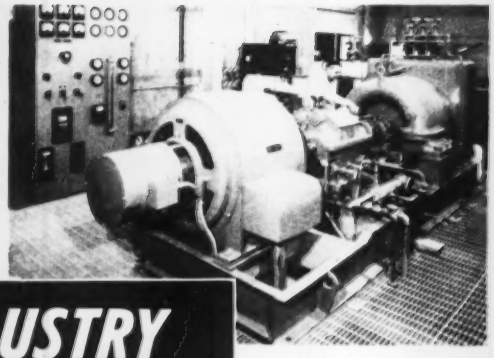
LONG AND ACTIVE LIFE—That's what an engine maker has found is a distinct advantage of carbide-tipped drills. On one operation drilling cast iron valve guide bushings this drill life is stretched out to four times its original length. Job is being run on a 6-spindle automatic at effective drill speeds of about 200 sfm. Drills are about 11 32-inch in diameter. Actual capacity of the new drills is estimated to be about 9000 pieces per grind. Important result is the saving of much down time (for changing tools), an expensive item on any automatic operation. p. 93

MORE MILES—Induction heating application, now being worked on by Tocco Division of The Ohio Crankshaft Co., may lend impetus to the automotive horse power race. Object is to induction harden the bore in a conventional soft cylinder block. Researchers on the job think it will be especially valuable for trucks and fleet operations, where there are high mileage requirements, and for marine uses.

LUBRICATION BY SQUEEZE—For years the problem of proper lubrication has plagued chain makers. Getting the oil to the right spot and keeping it from being thrown off has been a tough problem to whip. Now one of the manufacturers is tackling the job from a different angle. He's making the bushings for the chain from powdered metal. The resultant porous bushing is then impregnated with oil at some 200 to 300° F. When the chain goes to work and the load is applied, oil is squeezed out and lubricates the joint. First problem of getting the bushing rugged is apparently licked. Possibility of rejuvenating the chain by submerging it again in hot oil before it wears out is being checked.



In this experimental nuclear breeder and steam electric power plant operated by Argonne National Laboratory, heat is transferred twice: First from a hot radioactive, molten sodium-potassium alloy to another molten nonradioactive alloy, and then to steam in a boiler. Turbine and generator (bottom) operate on the steam



The Facts About . . .

ATOMIC POWER IN INDUSTRY

By DR. ALLEN G. GRAY
Technical Editor

An atomic reactor already is delivering electric power on an experimental basis. Industry has a job to do if it is to cash-in on the potentialities of atomic power and radioisotopes

ATOMIC ENERGY developments will become more and more significant to industry.

Granted, present-day applications of atomic energy are somewhat removed from the metalworking industry except for occasional use of radioactive tracers. Significant uses are still in the realm of the military.

Nevertheless, indirect effects of atomic enterprise are being increasingly felt and will benefit industry technology, overall. It takes but little imagination to see that promise for the future is bright.

In the 12 years that have passed since the U. S. atomic energy development was started early in 1940, when $6000 was made available for laboratory studies, appropriations for military applications have totaled $12 billion.

Is there a peacetime future for the atom? Just what does atomic power mean to industry? Those people who are most in the know think there won't be too many disappointments in the long run.

But certain fundamentals must be kept in mind: Atomic energy provides a new kind of fuel for thermal generation of power. From this point on facilities of the type now in use turbines, generators, transmission lines will remain essentially the same. The goal then is cheaper fuel for generating electricity.

Keep Within Reason — The experts agree that when we speak of atomic power, the end result will be heat-to-steam-to-electricity probably on a large scale. At best atomic energy will replace only the firebox boilers of conventional plants and therefore simply cannot have a revolutionary effect on our industrial economy.

This is contrary to a popular misconception that a secret process of some sort is being sought which will miraculously make electric power free to the consumer.

Of the total cost of delivering power, about 20 per cent is accounted for by the cost of operating the thermal facilities. Thus, when power from atomic energy becomes a reality there will be no startling changes in its cost, at least in the foreseeable future.

Not Small — Reactors using atomic fuels must have a large thermal and electrical capacity to be competitive with low cost fuels. Units to produce 100,000 to 200,000 kw of electricity are being considered. Most manufacturing plants could not use units of this capacity for electricity or process steam.

What about atomic fuels to power trucks, tractors and automobiles? Dr. L. R. Hafstad, AEC's director of reactor development, suggests that a reactor for an automobile would consist of a critical mass of plutonium, possibly 1 or 2

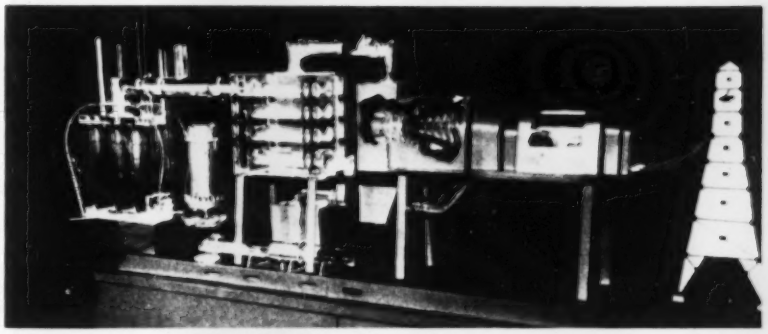
ATOMIC REACTORS—FOR THIS GENERATION

Research tool—University and industry

Mobile Power—Exclusively military

Fissionable material for the atomic bomb stockpile

Electric power plants



Columns at extreme left represent the nuclear reactor heat source in this Westinghouse model atomic power plant. Water is circulated through heat exchanger to give steam which drives the turbine and generator at right

feet in diameter, surrounded by a concrete shield at least 6 feet thick. Such a device would hardly fit in your gas tank.

Plenty of Energy—But face the facts. Nuclear reactors are a new type of power machine. They are a functioning reality. Granted they are large, complicated and expensive; they do provide the most concentrated energy source yet devised by man.

What new tools and new knowledge do we need to build economical atomic power plants?

Atomic Energy Commission, though hard at work on atomic power units to drive military ships and planes, also is discussing power plant possibilities with a number of industrial groups. True, today, it's hard to justify the use of nuclear fission for industrial power on an economic basis. However, Gordon Dean, AEC chief, predicts that the first stationary atomic power plants probably will be designed in 1953. They may be package units to be used in isolated areas where costs of handling fuel are abnormally high.

Weapons Come First—Major portion of AEC's effort during 1953 will, as in the year just past, be devoted to improving atomic weapons. AEC figures that the day may come in the not-too-distant future when the stockpile of atomic weapons will be adequate for our needs. Result: There will be a surplus of fissionable materials for nonmilitary uses.

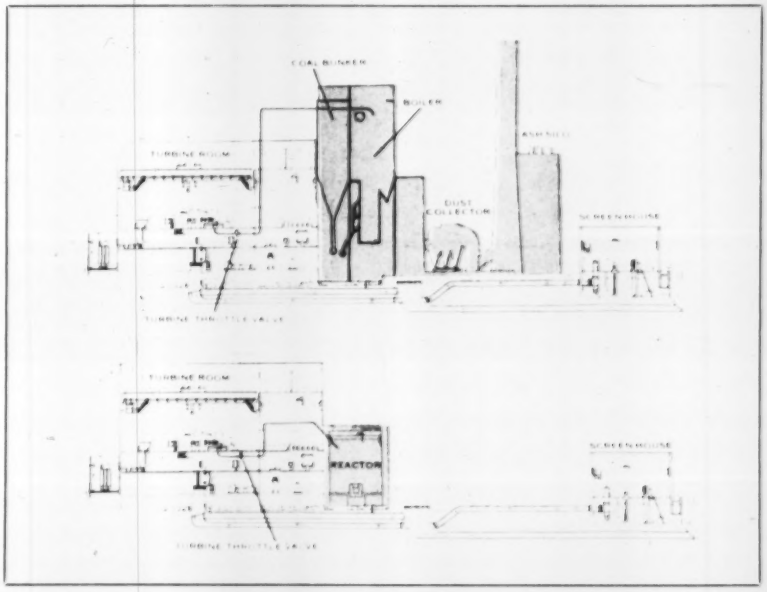
Dr. Gray has worked on atomic projects and is a member of AEC's advisory committee on information for industry

Most promising possibility and the one AEC is working hardest on is use of atomic fuel to generate electric power. Last year AEC secured W. L. Davidson, director of physical research for B. F. Goodrich Co., to head its Office of Industrial Development. Main reason for creating the new office was to develop business interest in the commercial aspects of atomic energy, and to sell the idea that industry should be willing to risk its own capital in atomic energy.

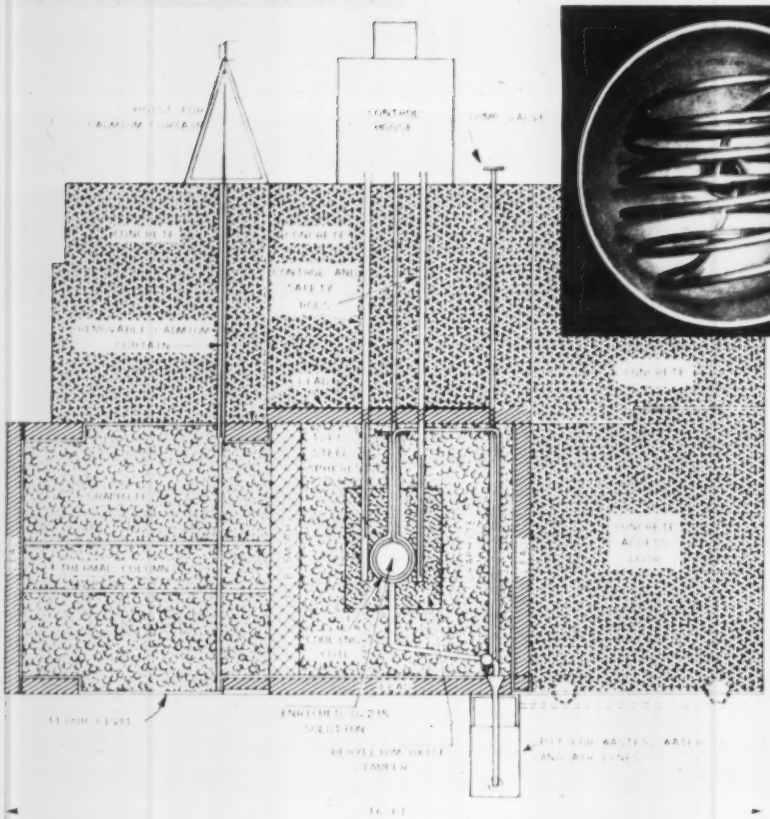
Heat Source—Atomic energy as it is known today is simply a source of heat. Outstanding characteristic is the small amount of nuclear fuel required to generate a large amount of heat. One pound of fissionable material is the equivalent of 1500 tons of high-grade coal or 200,000 gallons of diesel oil based on figures from the American Society for Mechanical Engineers. This is an important advantage in industrial applications since it virtually eliminates fuel transportation costs.

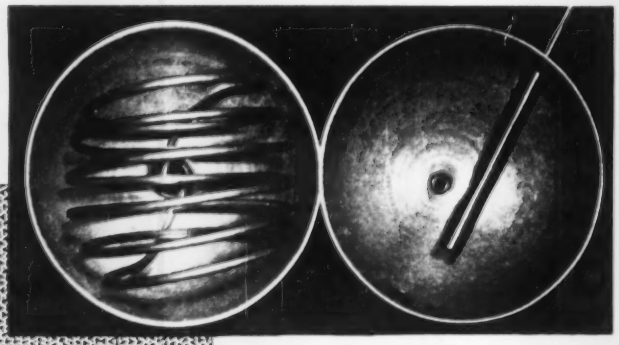
Concentrated Power—Other and weightier economic considerations will have to be taken into account before any conclusion for or against atomic power can be reached. In certain military applications, such concentrated power is of itself a sufficient advantage to make atomic power attractive.

Two examples are submarine and aircraft propulsion. In one case having so concentrated a fuel, and one that does not require oxygen, makes it possible to design a submarine that can cruise completely



Here's what Detroit-Edison's new St. Clair electric power plant might look like if coal fired boilers (top) were replaced by an atomic heat reactor (bottom)





Solution of enriched uranium salt is the fuel for this Los Alamos homogeneous reactor. Water circulated through stainless steel coil carries heat

submerged at top speed for extended periods of time. In the other it becomes possible to design a large aircraft that can travel at top speeds for extended distances. For these reasons, the Navy and the Air Force have assigned a top priority to the development of nuclear propulsion equipment and to the design of hulls and air frames to handle this equipment.

Two Directions — Two parallel naval reactor projects are in progress representing two lines of approach to the problem of designing a nuclear reactor for submarine propulsion. Furtherest ahead is the Submarine Thermal Reactor (STR) project, a co-operative effort of Argonne National Laboratory and the Atomic Power Division of Westinghouse. The reactor proper and its propulsion equipment are nearing completion.

An electric motor is encased in a stainless steel jacket and operates in a continuous stream of radioactive water. This water picks up heat from the nuclear fuel and flows into a boiler where the heat is transferred to regular water and then steam. The steam turns the turbines which turn the propellers.

Information gained during operation of this equipment at a land based test station will be incorporated in the design of a second reactor which will be installed in an operating submarine. The Navy has contracted with the General Dynamics Corp., Groton, Conn., (formerly Electric Boat Co.) to build the submarine hull. General Dynamics has the help of many subcontractors and suppliers.

Liquid Metal Carries Heat—The parallel activity is the Submarine Intermediate Reactor (SIR) project being carried out for the AEC by General Electric at the Knolls Atomic Power Laboratory, Schenectady, N. Y. As in the case of the Westinghouse project, there will be two reactors, SIR-A and SIR-B. The first will be tested on land and the second aboard ship. The G-E land based reactor will be tested in a unique steel sphere 225 feet in diameter which will enclose the reactor installation.

This second nuclear submarine will have a different power plant since molten metal will be substituted for water as a coolant.

Not Easy—Development of a nuclear power plant is a complex task. It touches upon practically every branch of science and engineering. The stringent requirements have necessitated and received the best attention of steel suppliers and fabricators, valve manufactures and hundreds of companies making pressure vessels, heat exchangers, pumps and a host of other materials and pieces of equipment which make up this unique and revolutionary submarine power plant, Charles H. Weaver, manager, Westinghouse Atomic Power Division, told the National Association of Manufacturers at their 57th Annual Congress of American Industry.

Crying need of the atomic power engineer is structural materials that will withstand heat and neutron bombardment. Zirconium is the structural material of the submarine reactor core. Newest of the wonder metals, it may be the key to successful power generation. A light but strong metal, it stands up well at elevated temperatures. Most important: It does not absorb neutrons and leaves them free to promote nuclear reaction.

Other materials useful in atom work include beryllium, boron, gallium, rare earths, aluminum and titanium. The atom program also demands its share of nickel and stainless steel tubing.

Growing — In November 1952,

SOME OF THE PROBLEMS

1. Materials of construction to stand-up at high temperature under neutron bombardment without absorbing neutrons.
2. Noncorrosive coolants meeting above requirements.
3. Durable containers and conduits for coolants.
4. Less-expensive fuel element fabrication.
5. More efficient heat transfer equipment.
6. Fabrication of intricate shield shapes.
7. Shielding of personnel and instruments against radiation.
8. Control gear for reactors with high heat output.
9. Chemical reprocessing to recover unused and "bred" fuel.
10. Handling and disposal of radioactive wastes.

Westinghouse announced the participation of the Newport News Shipbuilding & Drydock Co. as its subcontractor in the additional responsibility of developing a nuclear power plant suitable for the propulsion of large naval vessels, such as aircraft carriers. This power plant will be considerably larger than the submarine plant and will produce power to an extent comparable to our large utility electrical generating stations.

Manufacturers of nuclear power plants have many problems to overcome which are common to all reactor types and the solution of these problems is basic to the ability to effectively apply such reactors on a sound economic basis. The development of materials and fabrication techniques, the design of unique equipment to handle heat transfer media and control the reactor, an understanding of radiation effects, development of practical shielding methods—all of these are important parts of the naval reactor program. Work accomplished under these naval propulsion programs will provide a sound foundation for future nuclear power plant engineering.

In the Air—Two aircraft reactor projects are in progress. One is a two year old joint effort of Consolidated-Vultee Aircraft and the Aircraft Gas Turbine Division of General Electric Co. Work on development of the reactor proper is being done under AEC contract and work on associated propulsion equipment under Air Force contract. Plans are being made for land based test facilities.

A later venture is between Boeing Airplane and Pratt & Whitney division, United Aircraft. Oak Ridge National Laboratory is conducting investigations into various aspects of aircraft nuclear propulsion and is supplementing the theoretical and experimental studies of contractors.

It's perhaps safe to predict on basis of present day prospects that nuclear powered aircraft will be used for specialized military purposes, and not for commercial transportation. Chief obstacle: Weight of the shield needed to protect the crew and passengers from nuclear radiation. But suppose 30 to 50 tons of shielding are required. The fuel in a gassed-up modern bomber often weighs 60 tons. Perhaps then, weight is not the highest military hurdle.

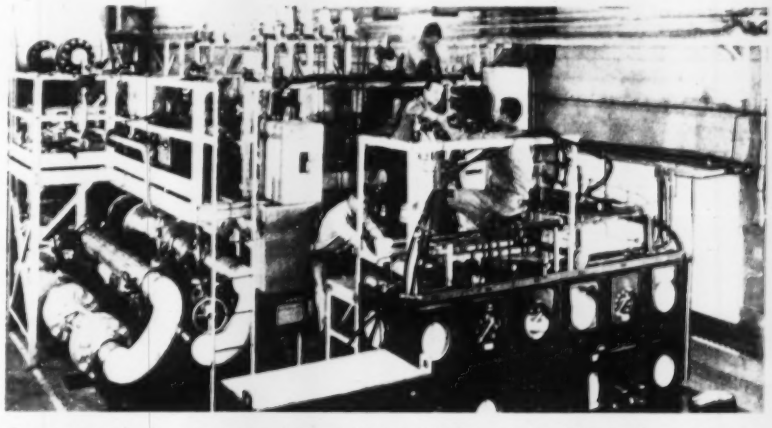
Power Stations—Most everyone agrees that someday private business will build and operate atomic power plants on a large scale. But as to when this will come, there has been a rather wide spread of opinion.

There are technical difficulties which have to do partly with basic feasibility and partly with costs. The principal problem in the first category is that of finding materials of construction that will stand up under the combined temperature-corrosion-radiation conditions associated with a nuclear reactor producing heat at a high enough temperature for efficient power generation.

Conditions Are Tough — Three basic requirements limit the selection of metals for use in power reactors: 1. Resistance to radiation damage, 2. high temperature characteristics, 3. transparency to neutrons. Of the commonly available engineering materials some of the stainless steels have good properties in these respects, except that their absorption of neutrons is rather high.

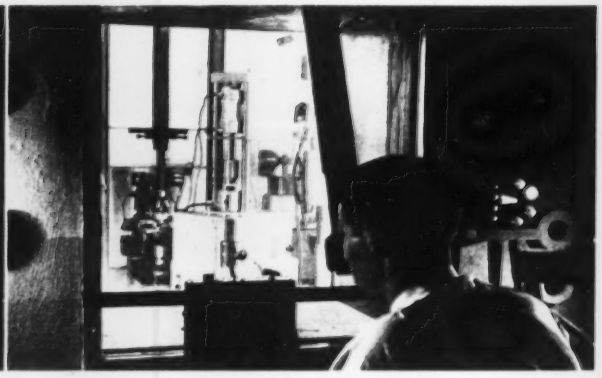
Zirconium is good in all three respects, provided its common impurity, hafnium is entirely eliminated. Hafnium has extremely high absorption for neutrons whereas zirconium is favorably transparent. The hafnium by-product resulting from the purification of zirconium provides an excellent material for reactor control rods because of its high neutron-absorbing qualities. It is expected to become important as an industrial metal in its own right in the future.

There are difficult metal problems in connection with heat trans-



Reactor coolant pumps are being thoroughly tested by Westinghouse in this installation before they are used in the submarine thermal reactor prototype

This milling machine is operated by remote control to cut the end off a container holding radioactive material



Radioactivity affects hardness of materials. Here, a long range microscope measures size of indentation in tests

fer aspects of atomic power reactors. If water is used as the heat transfer medium between reactor and boiler, then heavy walled, high pressure plumbing is required. This means high neutron absorption and reduced efficiency of the reactor.

Liquid metals seem most desirable for heat transfer. Sodium or sodium - potassium mixtures seem most promising at the present time. Here also difficult problems arise since they are difficult to handle, particularly at red heat. Problems such as high-speed pumping of liquid metals at high temperatures are receiving a lot of attention.

Problems—Of the 10,000 scientists and engineers presently engaged in research and development in the atomic energy field some 25 per cent work on basic and applied research in physics, chemistry and metallurgy. Twenty per cent work on the development of improved nuclear reactors and reactor systems. The metallurgist's principal responsibility is that of finding materials of construction which will stand up under the extreme conditions encountered.

Four industrial teams have recently completed a one-year study of the AEC's reactor development program from the standpoint of power possibilities using their own money to finance the investigations. They were: 1. Monsanto Chemical Co. and Union Electric Co.; 2. Detroit Edison Co. and Dow Chemical Co.; 3. Commonwealth Edison Co. and the Public Service Co. of Northern Illinois; 4. Pacific Gas & Electric Co. and Bechtel Corp.

Best Bet — A breeder reactor which will produce more fissionable material than it consumes appears to be the most feasible for generation of electric power on a long range basis.

In a breeder reactor, the core or critical mass contains fissionable materials which may be either uranium 235 or plutonium 239. The atoms of these fissionable materials in the core are fissioned to produce heat as required, and simultaneously, the neutrons which are liberated during the process convert atoms of natural uranium 238, which is not fissionable, into plutonium 239, which is fissionable.

The physics of the reaction are such that theoretically more plutonium, or fissionable material, is created than is consumed. This man-made fissionable material can be isolated or separated and used in the core as the fuel to produce more heat and more plutonium. Surplus plutonium can be made available for other requirements.

In this system, however, atomic energy would simply furnish the heat needed to produce steam and operate steam turbine generators, according to Walker L. Cisler, president, Detroit Edison Co. Mr. Cisler told the Society of Automotive Engineers at their recent annual meeting that the second phase of the Dow-Edison project, which consists of a preliminary design of a breeder reactor believed appropriate for commercial applications, is progressing encouragingly.

Replace Boilers—Reactors burning fissionable materials as a fuel would, with appropriate accessories, take the place of boilers and appurtenances of conventional thermal-electric power generating plants. The electric generating part of the plant would be retained essentially in its present form. In the atomic system extremely large amounts of heat would be released in a small volume and transferred at a high rate per unit of heat exchanger area.

There is no good evidence that the first installations can be built at costs which will make the power produced competitive with present day conventional generating methods. Considering the small physical size of reactors, as compared with conventional fuel-fired boilers, and other engineering factors, the cost problem does not appear to be insurmountable. After initial experience in reactor design and construction is gained, the economics-goal may well be reached for units having large thermal and electrical capacities.

Left Overs May Help—Reactor products and by-products may hold the key to the competitive cost problems in the production of electric power. If these have great value, and the reactor is given proper credit, then the cost of electricity might be lower than now envisaged.

At the present time, plutonium 239 and uranium 233 are the only definitely known useful fissile products. For the present, plutonium is an extremely important weapons material but it is anticipated that many peacetime applications such as using it as a fuel for marine transportation and as fuel for an initial charge in stationary reactors may develop.

There is good reason to believe that plutonium and uranium 233

will have peacetime markets but probably at lower value than their present military value. Also it is reasonable to expect that many useful reactor by-products will be developed. Some scientists believe that possibilities in this field are great.

For the present, at least, it must be assumed that the value of reactor products will be modest. Evaluations are being based on the competitive value of the available heat energy in the atomic fuel. Thus the major expense of operating a power system very probably cannot be substantially altered by the substitution of atomic heat for many years at least.

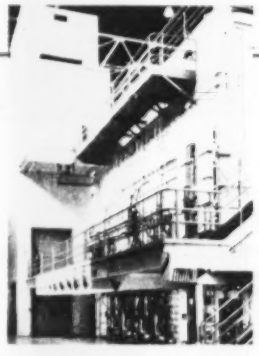
Being Tried — The experimental breeder reactor (EBR) designed by the Argonne National Laboratory is the most advanced power reactor in operation today. AEC is pushing to find out just how much, if any, fuel can be produced in excess of the quantity of fuel burned.

The reactor core is about the size of a football. Liquid sodium-potassium alloy removes heat energy from the machine and generates a superheated steam. This steam flows through a 250 kw turbogenerator system to produce electricity.

Framework — Surrounding the small control core is a br blanket of natural uranium blanket absorbs neutrons from the core to produce plutonium fuel. A cylindrical tank containing the sodium-potassium alloy coolant holds the blanket and fuel. Surrounding this tank is a reflector to turn back escaping neutrons. The entire atomic reactor is surrounded by a shield of lead and concrete to absorb the fission process radiation.

Dual Coolant System — From a storage tank above the reactor, the coolant flows through the reactor by gravity. Electromagnetic pumps force it through a primary heat exchanger and back up to the storage tank. This entire system requires shielding because the coolant becomes radioactive in flowing through the reactor. This calls for a secondary coolant system where another sodium-potassium alloy removes the heat from the shielded exchanger. This coolant does not become radioactive ("hot") since it does not flow through the reactor.

Simplified—One approach for decreasing construction costs of atomic reactors may lie in the direction of a so-called homogeneous reactor. In this case a nuclear fuel



Largest research reactor is operated for AEC by Brookhaven National Laboratory. It serves educational institutions, government and industry

How To Get Started

HOW can you be sure your industry is not passing up a good bet in some phase of atomics? There are various levels where you can start if you want to find out what atomic energy may hold in store for you.

A single individual in your organization can be assigned to the job of keeping abreast of the open technical literature in the atomic energy field. Make it a point to become acquainted with the information activities sponsored by the AEC. Since most of the technical information bears directly on commercial techniques, it follows that such data is of great interest to industry. Chief of AEC's industrial information branch is Norman H. Jacobson, who spearheads the information for industry program.

On Up the Ladder—For a higher level of participation you may want to incorporate a hot lab into your research and development facilities to benefit from the by-products of atomic energy.

To get into the subject a little deeper, you can request permission to assign one of your men to a national atomic laboratory for a year of experience. He will get on speaking terms with a number of different phases of the atomic program and can appraise possible areas of interest back at home.

Many companies have gotten atomic experience by accepting research and development contracts from the commission to carry on work in which they have specific competency. Others contract to operate one of AEC's facilities.

New Business—Perhaps you have an idea that your firm would like to exploit some phase of the atomic energy field—build radiation instruments, make equipment or maybe supply strategic materials needed in atomic work. Where would you go to see if something could be worked out?

Central clearinghouse for such ideas is AEC's Office of Industrial Development in Washington. Director W. L. Davidson will help you assess your capabilities in the atomic energy field and the need for the product you have in mind. He will suggest places in the AEC organization where you can get further help.

Already Started—The radiation instruments industry, which has grown up since the war, is now grossing $20 million a year. The needs of the atomic program, have given rise to several other new or expanded private enterprise businesses, including the uranium mining industry, commercialization of fluorocarbon liquids and plastics, the synthesis and sale of tagged molecules, and industrial production of zirconium metal.

Other industries may in time result from the 500 AEC owned patents with have been made available for licensing to the public on a nonexclusive royalty-free basis. To indicate the interest that has been shown in this matter, some 275 licenses have already been issued.

is dissolved or dispersed in a liquid carrier which is circulated in and out of the reactor.

In this type of reactor instead of carefully machined fuel elements made of unusual materials, the reacting parts will consist of a solution, or a slurry or mixture of very fine particles. This slurry can be pumped through a tank in which the nuclear reaction takes place, and then pumped out again. The heat generated by the reaction can be used with a heat transfer mechanism to provide electricity.

In the Millions — A relatively small packaged atomic power plant will run around $3 to $5 million. A large central station will hit $50 to $150 million. While it's true industry will venture thousands of dollars in search of future profits, when it gets into millions of dollars the complexion changes. Unless stockholders see short range profits, their enthusiasm is dampened.

Changes Needed — Still another deterrent, and everyone hopes it's only temporary, is the Atomic Energy Act. It states that the government alone can own fissionable material and facilities for producing or using fissionable material at any except a research level. It's hard to visualize any industrial group investing millions in something they cannot own.

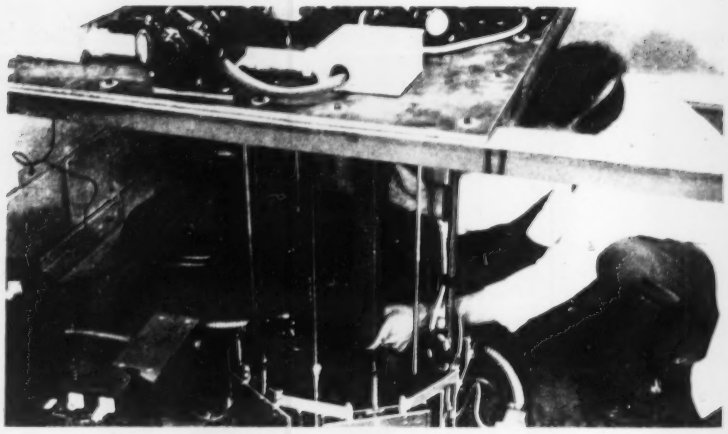
The matter of security is another ham-string. The Atomic Energy Act demands that no secret information fall into questionable hands. Almost 20 per cent of the people employed by the AEC spend their full time carrying out these security jobs. This would certainly be an added burden of overhead to any project faced with the task of paying its way.

There are more than 150,000 people currently working on atomic energy projects and of this number only some 7000 are direct employees of the AEC. More than 5000 firms are doing or have done jobs for the AEC.

By-Product Values—Used in one way or another, radioisotopes, by-product of the atomic pile, are helping solve many industrial problems.

The use of radioactive cutting tools to measure the rate of tool wear is important in studies on increasing tool life in machining operations. By rendering a cutting tool radioactivity by neutron irradiation in the nuclear pile, its rate of wear can be measured directly by the radioactivity of the chips within seconds of the cutting time.

The amount of radioactivity of the chips is a direct measure of how much the tool has worn, since this radioactivity is due only to the minute amounts of material worn from the tool. Result: Relative values of tool life can be judged in minutes instead of hours.



Sample of material is inserted in thermal test reactor. This is one of two zero power reactors at the Knolls Atomic Power Laboratory

Many and Varied Uses—Radioactive piston rings are used to measure the effect of different types of motor oils on ring wear. Impurities in high purity metals are made radioactive by neutron irradiation in a reactor. They can then be detected by their characteristic radiation. Impurities present in quantities too small to be detected by spectrographic analysis can be measured.

Tracer studies have proved that the total sulphur content of coke is controlled only by the total sulphur in the coal and does not depend on the way the sulphur is combined in the coal. Similar methods have thrown new light on the mechanism of brighteners in plating baths, and effectiveness of metal cleaners.

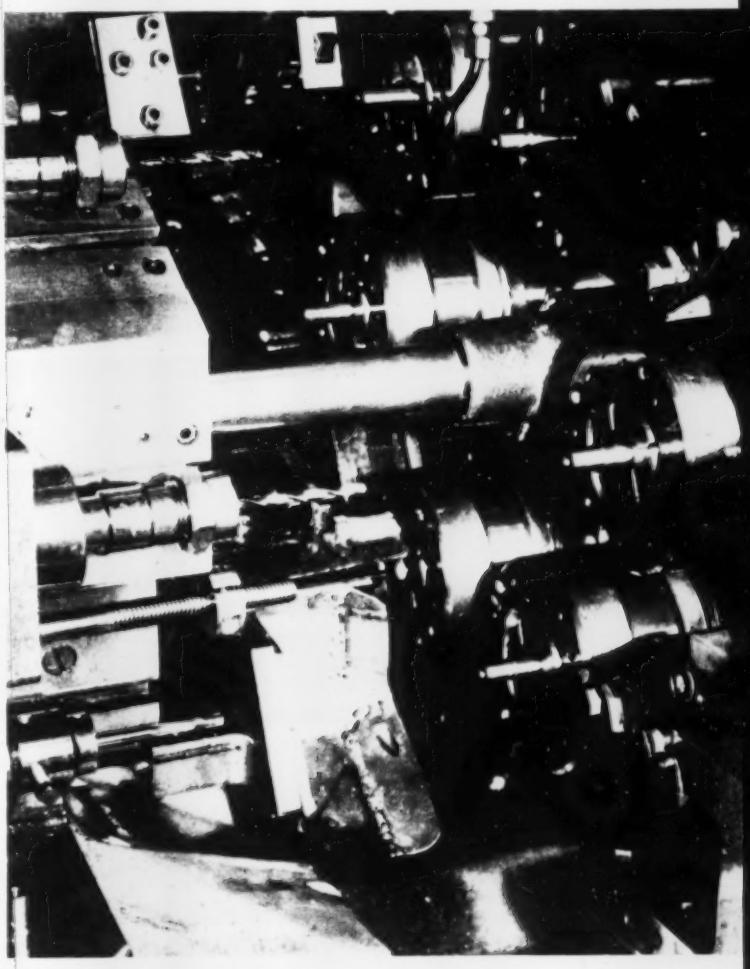
Use of high-intensity radioactive cobalt, and other artificial radioisotopes which can be produced at high intensity levels in the nuclear reactor, for radiography of castings and metal structures is another application of atomic by-products and one growing rapidly in importance.

Use of radioisotopes as tracers is based on the fact that they can be substituted in chemical or metallurgical systems without affecting the processes involved.

Possible defects in this heavy casting will be revealed on photographic film exposed to gamma rays from radioactive Cobalt 60 at Ford Motor Co.

Carbide Steps Up Drilling Job

Tips brazed to drills help make production roll. Longer life between grinds plus high speeds and feeds offer gains with new setup. Material is cast iron for valve guide bushings



Three drills and reamer, all tipped with carbide, remove stock from cast iron valve guide bushings on Greenlee 6-station automatic

DRILL LIFE is stretched out to nearly four times its original length on production drilling of cast iron valve guide bushings. Drilling time is 10½-seconds.

Operation is being performed at Hercules Motors Corp., Canton, O., makers of high-speed, heavy-duty gasoline and diesel engines. Effective drill speeds are close to 2000 rpm (200 sfm) and a feed of 0.015-inch per revolution is used. Drills are tipped with grade 883 Carboloy cemented carbide.

Long Life — Drills were changed once per shift with previous tooling. This is equivalent to once every 2600 pieces. Hercules estimated the capacity of the new drills to be around 9000 pieces per sharpening.

Cast iron slugs from which the guides are produced have a Brinell hardness of 180. They are rough centerless ground by the foundry to 0.015-inch limits; then centerless ground by Hercules as an inspection operation, holding the OD within 0.001-inch. This provides a controlled collet diameter for the Greenlee automatic, where the slugs are mounted to extend 1½-inches out of the collet. Total length of the slugs is 2⅞-inches, with an OD of 1 11/32-inches.

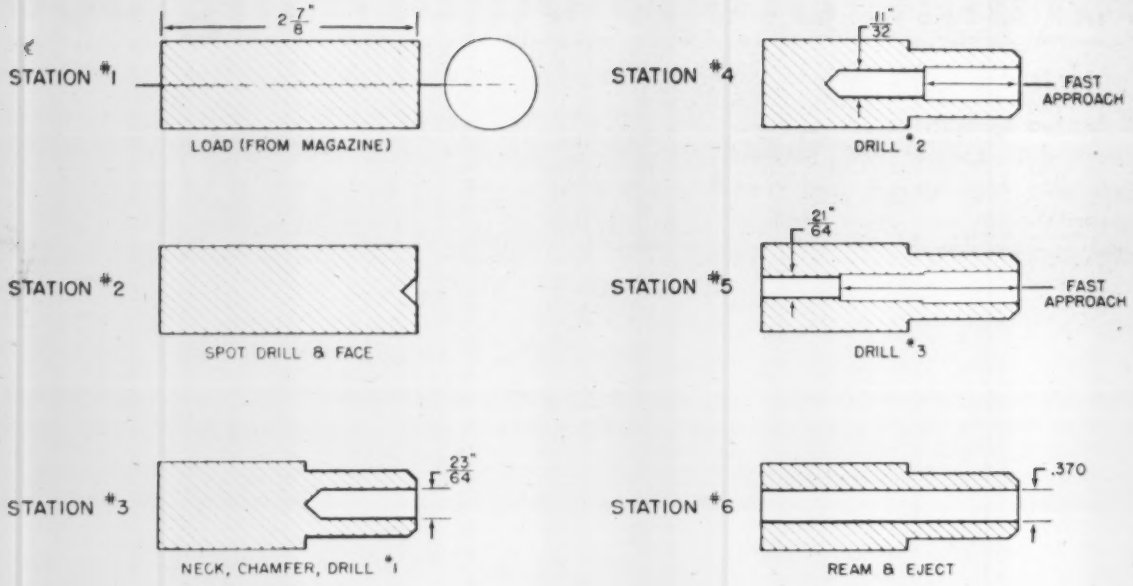
Sequence—Blanks are magazine loaded on the first station. Then they are spot drilled and end faced on the second station.

Next three stations employ the carbide drills. These drills are of progressively smaller diameters (25/64, 11/32 and 23/64-inch) and are each fed one-third of the length of the part. Use of this step drilling sequence permits second and third drills to be fed at a fast approach rate through previously drilled clearance holes, reducing cutting time for each operation. This increases overall production rate for the machine which is determined by time of the longest operation.

Drills In—At the third station, the cast iron slugs are necked and chamfered, with carbide tipped cutting tools, and the first carbide tipped drill is fed one-third of the way into the cast iron slug at a feed of 0.015-inch per revolution and a combined drill spindle and collet speed of 1897 rpm. Surface speed is 178 sfm on the drill.

Fourth station employs an 11/32-inch carbide tipped drill at the same speed and feed as previous station. This operation penetrates the guide bushing the second third of its length. Station five removes the final third of the drilled stock with a 23/64-inch Carboloy tungsten carbide tipped drill at the same rate of feed and speed, preparatory to the reaming operation.

Limits Held — The step-drilled hole is reamed with a 0.370-inch



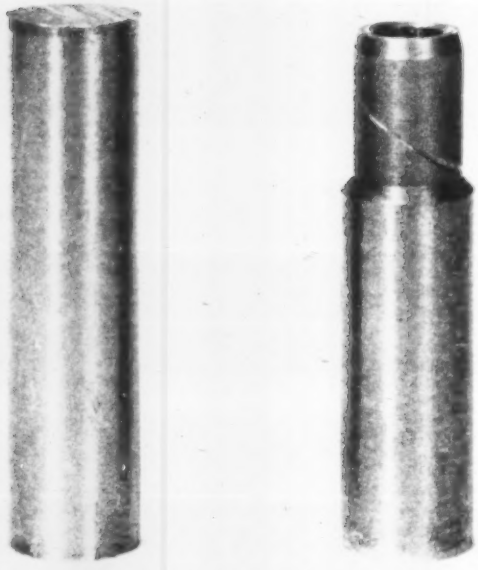
Layout shows sequence of operations performed to produce valve guides from round semifinished slugs. Note the fast approach allowed by step sequence

diameter carbide reamer on station six and the part is ejected. The reamer used here is carbide tipped also.

Concentricity of the carbide drilled and reamed hole with the outside diameter of the bushing is held to 0.004 to 0.005-inch indicator reading on this machine. Since collets currently being used are the ones that came on the machine in 1943, the accuracy of the drilling and reaming operations is all that can be expected.

Safety Stroke — Coolant used is 75 per cent kerosene, 25 per cent machine oil, pumped through the spindle and filtered through a No. 821-10 Bowser bag-type filter. The collets and spindles are cleaned about once every two weeks of operation.

As an added precaution in the drilling operation, to avoid chance of the carbide drill contacting the cast iron stock at the high approach speed, the work stroke is set at $1\frac{1}{2}$ inches, which is longer than necessary.



Here are before and after views of the guide bushing. Outside diameter is also turned down with carbide tools. Drilling time is 10.5 seconds

are you still running nuts one-at-a-time?

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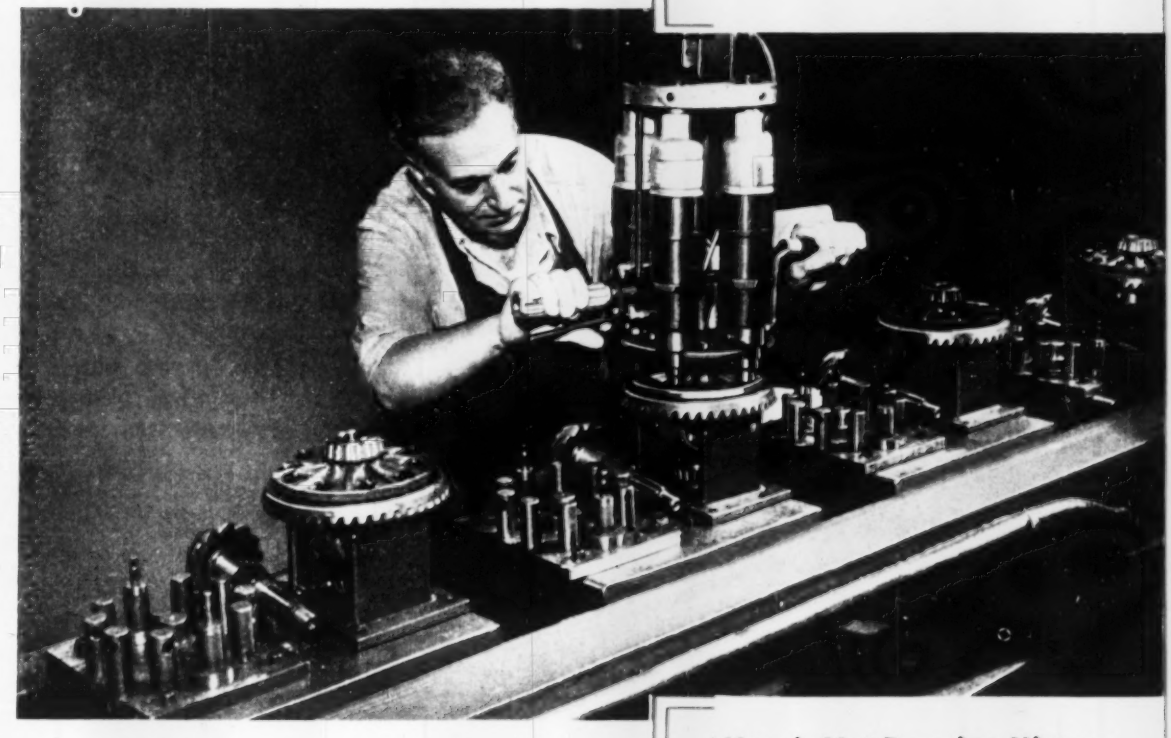

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MULTIPLE NUT RUNNERS GIVE YOU:

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1917	Speeder Wrench	100 Man Hrs.
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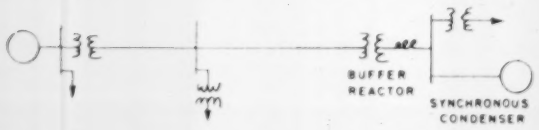
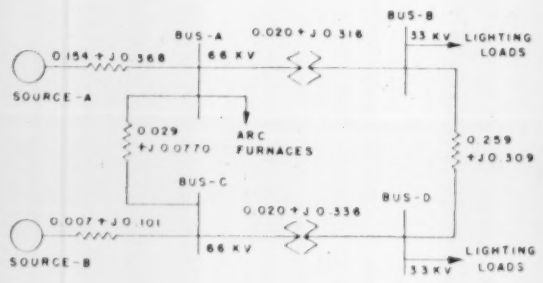


Fig. 4 Synchronous condenser and buffer reactor for limiting flicker voltage. System elements the same as Fig. 2 (which appeared in Part I) except as noted



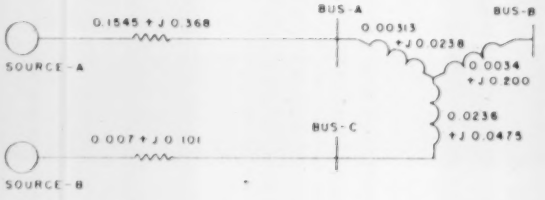


Fig. 5 (top) Flicker must be limited on bus B because of critical lighting load. Fig. 6 (bottom)—When system in Fig. 5 is converted to this system the flicker limit for critical lighting loads is altered

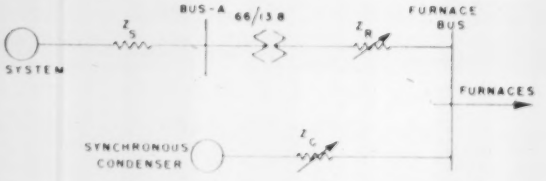


Fig. 7 Source and synchronous condenser in parallel divide the load swings inversely as their impedances

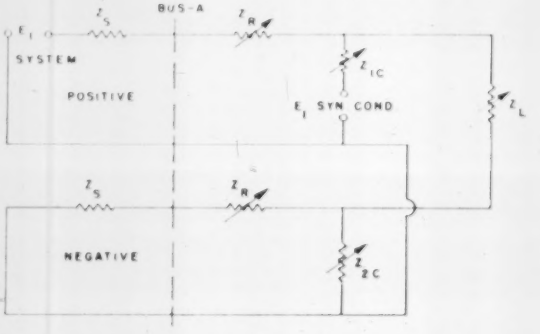


Fig. 8 Sequence connections for calculating flicker. Positive, negative sequence impedances are unequal

Flicker Control In Arc Furnace Power Supply

Sufficient information is presented in this concluding article to evaluate any reasonable combination of synchronous condenser and buffer reactor and effect of furnace size for any system impedance

By R. F. LAWRENCE
and
R. L. TREMAINE
Electric Utility Engineering
Westinghouse Electric Corp.
E. Pittsburgh, Pa.

USE of a synchronous condenser and buffer reactor, as illustrated in Fig. 4, to limit flicker voltage frequently is a good technical and economical solution in the application of arc furnaces. The synchronous condenser for transient load changes is in parallel with the system, and absorbs a portion of the load swing. It absorbs the load change in proportion to the system reactance divided by the sum of the system reactance and the condenser reactance. The ability of the condenser to absorb some of the load change results in less flicker on the system because the load change supplied from the system is reduced. The buffer reactor increases the system impedance and improves the effectiveness of the condenser by making it absorb a greater percentage of the load change (principally reactive current).

An example is included here for a specific case of the application of a synchronous condenser with

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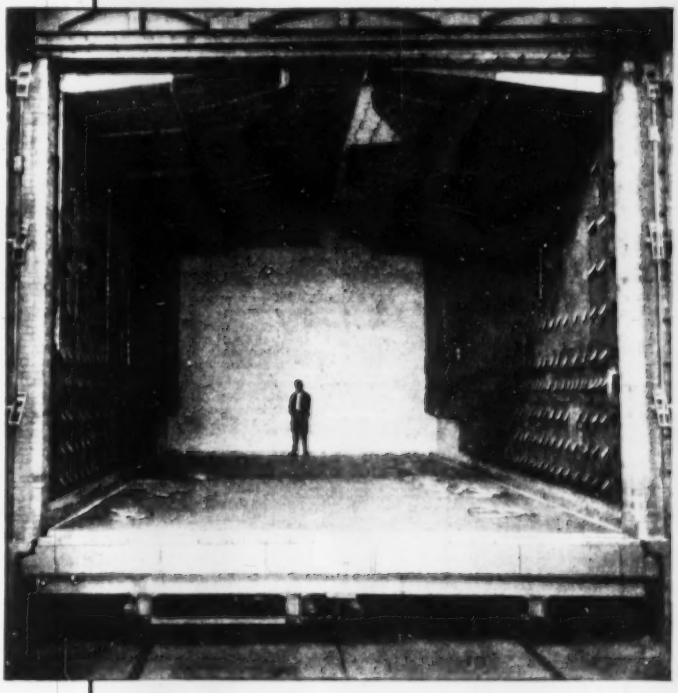

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Arch Area: 1330 square feet

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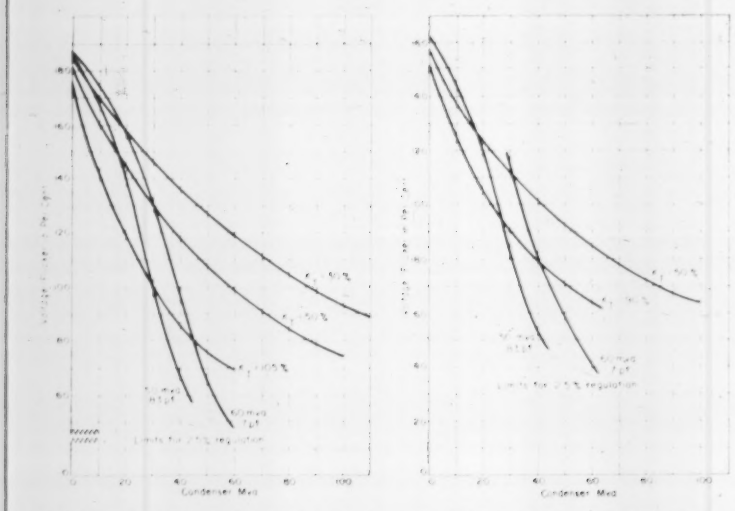
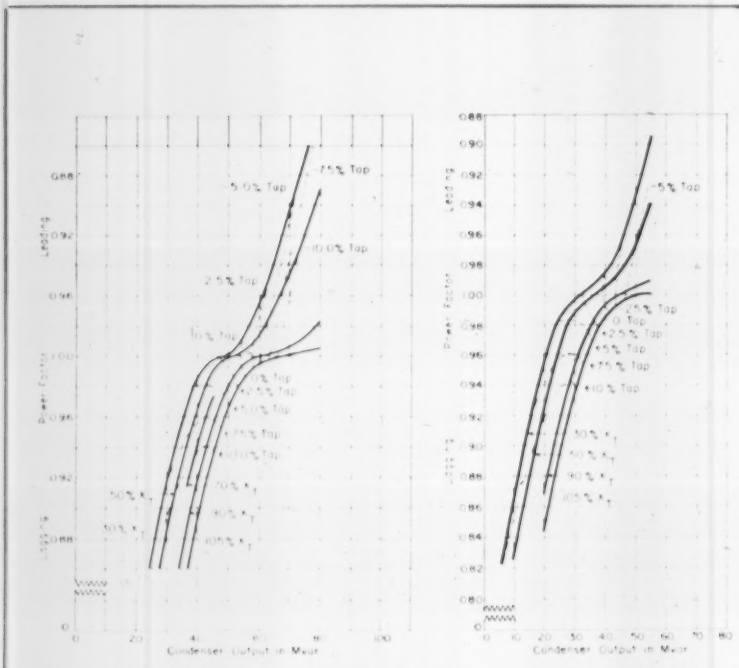


Figs. 9a (left) and 9b (right)—Maximum flicker voltages appearing on the system using various sizes of buffer reactors and synchronous condensers with a 20-mva (Fig. 9a) and with a 12-mva (Fig. 9b) furnace



Figs. 10a (left) and 10b (right) Power factor on bus A using different values of buffer reactor with two different loads on 13.8 kv bus

a buffer reactor for a system supplying an arc furnace load. The methods and principles involved in the solution of this example are in general applicable to the other corrective measures. The exception is the use of a series capacitor because of the problems which are noted previously.

In at least one case a series capacitor has been used in series with a synchronous condenser. It is recommended that a synchronous condenser and buffer reactor of the proper size be used on a new installation. Use of the series capacitor is better considered as an expedient for use on an existing installation.

Application of a synchronous condenser and buffer reactor to limit flicker is under consideration, and for this reason, a number of factors in addition to the flicker have been determined. Since a similar application would require a study of these factors, this example is given in fairly complete detail.

Factors Must Be Considered — Selection of a synchronous condenser and buffer reactor combination to obtain the most satisfactory solution to control flicker necessitates consideration of a large number of factors. To enumerate: The selection of a particular combination must take into account the magnitude of the flicker which will result, the power factor on the supply bus, the utilization of reactive output of the condenser to control power factor and voltage, the frequency of tap operation on the transformer, the stability aspects of the condenser, the steady-state regulation on the furnace bus, and last but by no means least, costs. Curves have been prepared from which these factors except the cost can be evaluated, for a particular application. A set of curves such as given in this example give sufficient engineering information to evaluate any reasonable combination of synchronous condenser and buffer reactor, as well as the effect of furnace size, for a particular system impedance.

This study was made on the following basis:

1. Both 12,000 and 20,000-kva arc furnaces were studied.

2. No allowance was made for the fact that there would be more than one furnace. The probability of simultaneous heavy load swings

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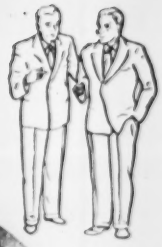

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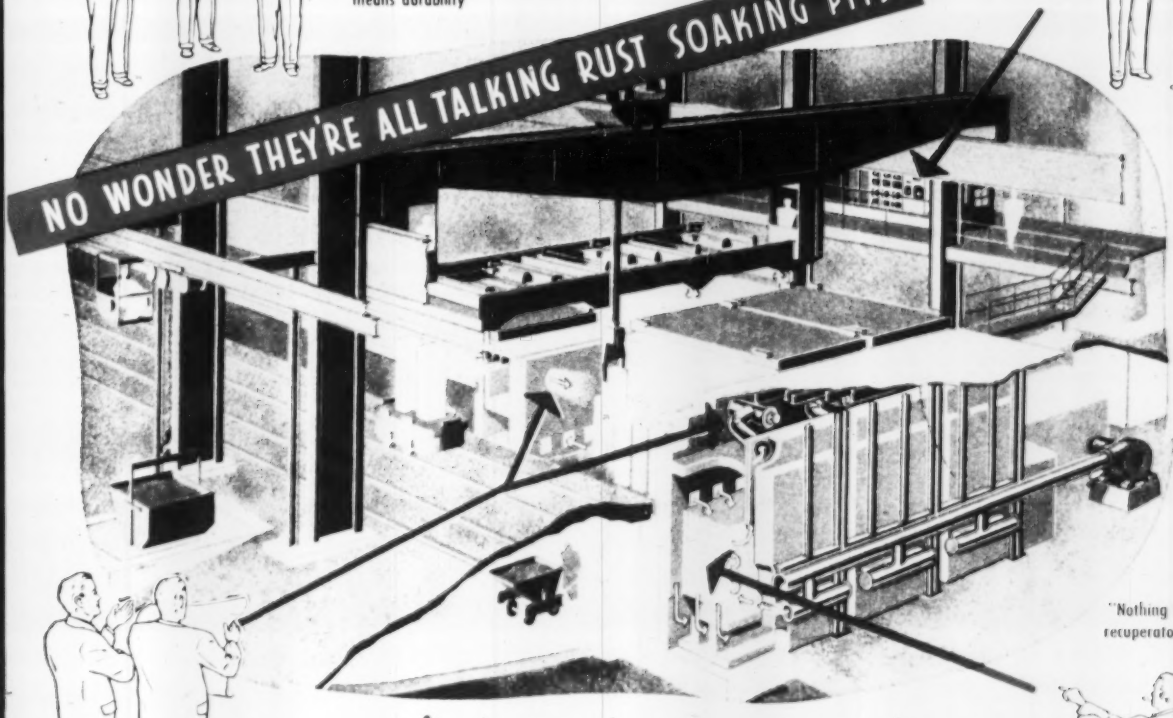

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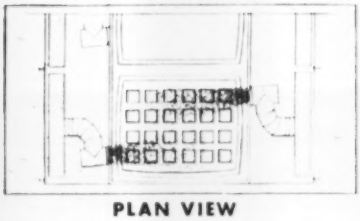
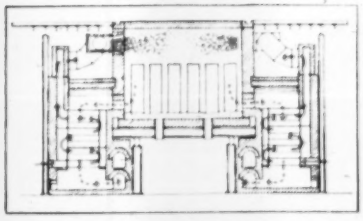


PLAN VIEW



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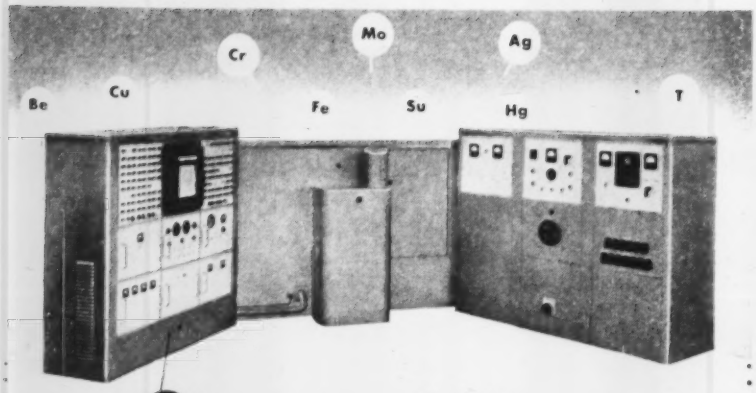

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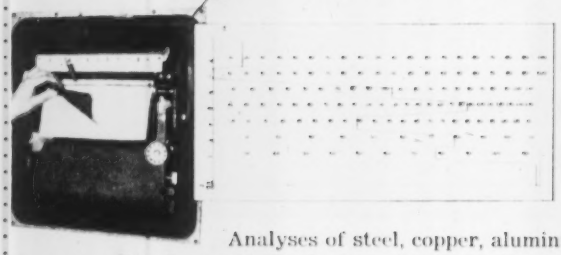

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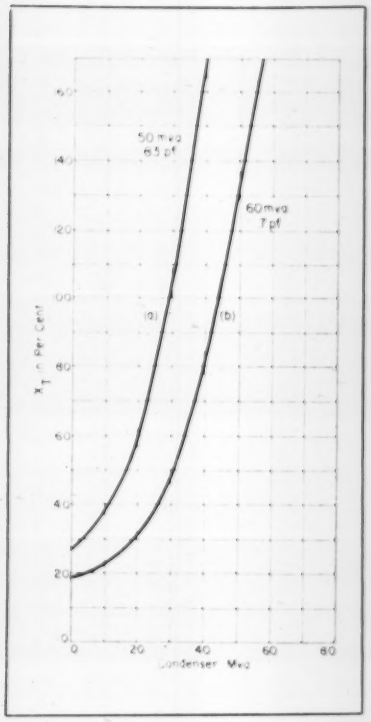

Fig. 11—Curves showing size of synchronous condenser required with a given reactor

is not great. This plus the fact that the steel company will try to stagger the meltdown periods, indicates that allowance for simultaneous heavy load swings is probably not necessary.

3. The load swings were assumed to be at the power factor indicated in Table I (see Part I). Constant per cent impedance was used to represent the load swings. This in effect means that the load swings are independent of steady-state voltage on the furnace bus, but are reduced by an increase in system reactance (addition of buffer reactor).

4. Transient reactance was used to represent the positive-sequence reactance of the machine. This assumption considerably increases the volume of work necessary, but has the advantage of giving a more conservative result. Several authorities[2,7,9] discuss the question of whether transient or subtransient reactance should be used. There is no strong evidence to indicate which reactance should be used.

5. Steady-state voltage on the furnace bus was to be kept within ±2.5 per cent. Steady-state voltage as used here refers to the voltage that would be indicated by a highly damped voltmeter as contrasted with the flicker voltage. Supply voltage would vary from 64 to 69 kv.

6. For voltage regulation calculations, two loads were assumed—60 mva at 70 per cent power factor, and 50 mva at 83 per cent power

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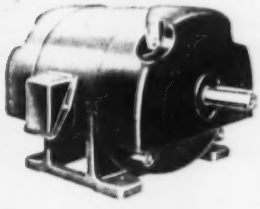

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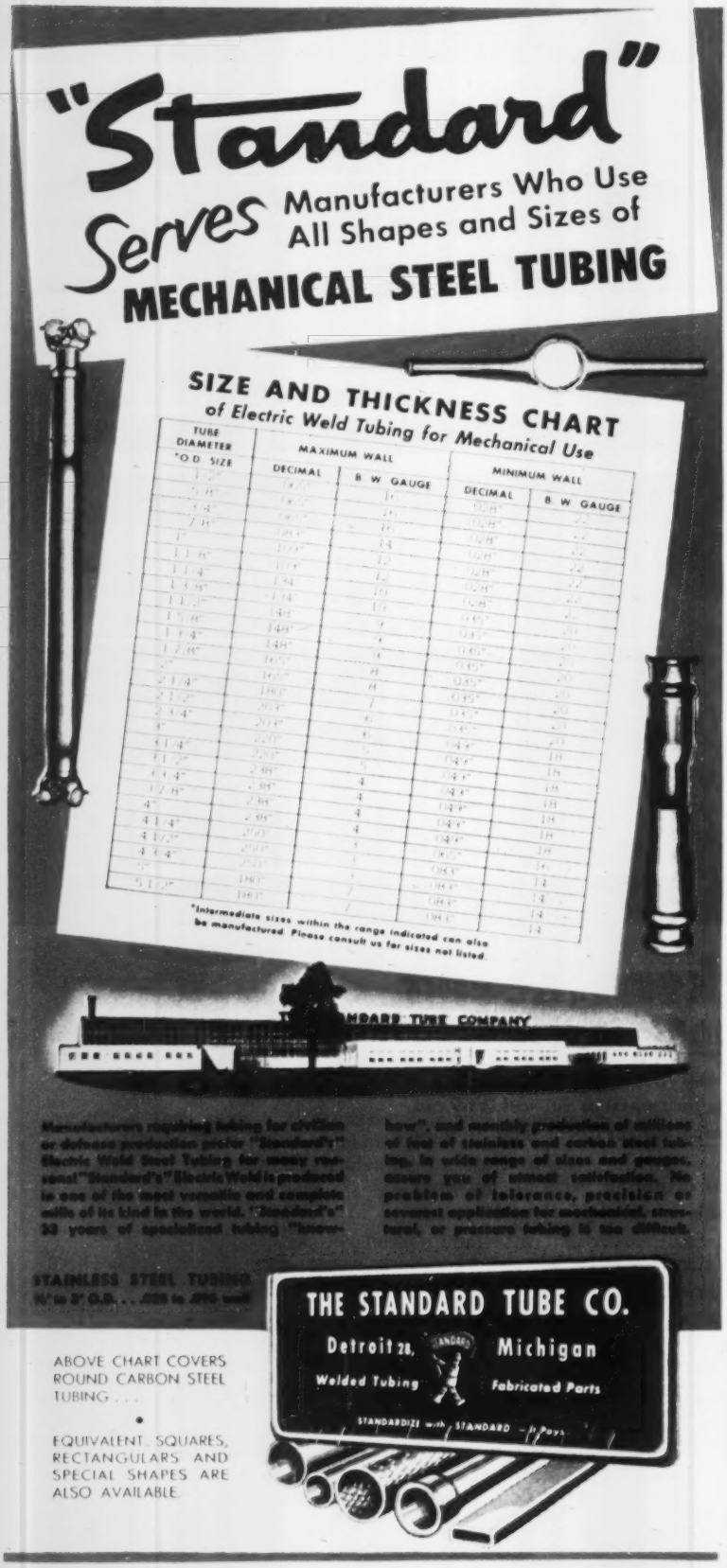
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factor. These two load conditions will likely bracket the operating conditions between all furnaces on meltdown simultaneously at low power factor, to staggered operation with higher power factor. The reduction in the size of the flicker reducing equipment resulting from careful operation of the furnaces should be noted.

In the system shown in Fig. 5, bus B is the closest bus to the arc furnace bus that supplies a critical lighting load, and hence the bus on which flicker must be limited. By converting the system to the equivalent shown in Fig. 6, it can be shown that the permissible flicker on bus A is 115 per cent of the limit established for critical lighting loads.

For transient load swings, the source and the synchronous condenser are in parallel as shown in Fig. 7, and divide the load swings inversely as their impedances. The larger the synchronous condenser, the smaller its impedance, Z_c, and hence the larger portion of the transient load swing which it will absorb. The addition of a buffer reactor, Z_r, increases the system impedance, thus forcing more of the load swing on the condenser.

The limit to the size of buffer reactor which can be used is set by the allowable regulation on the furnace bus and thus affected by the top charging under load range on the supply transformer which in this case was ±10 per cent. The voltage on the furnace bus is affected by the var output of the synchronous condenser; thus the buffer reactor size is also related to condenser kvar rating. Stability of the synchronous condenser might also be a limit.

The sequence connections for calculation of flicker where the positive and negative sequence impedances are not equal is shown in Fig. 8. The flicker was determined on bus A and then carried through one 30-degree transformation. The results of these calculations are shown in Figs. 9a and 9b.

Figs. 9a and 9b show the maximum flicker voltages which will appear on the system using various sizes of buffer reactors and synchronous condensers with a 20-mva, and a 12-mva furnace, respectively. The point of maximum flicker on the system will be on bus A. The curves marked "Limit for 2.5

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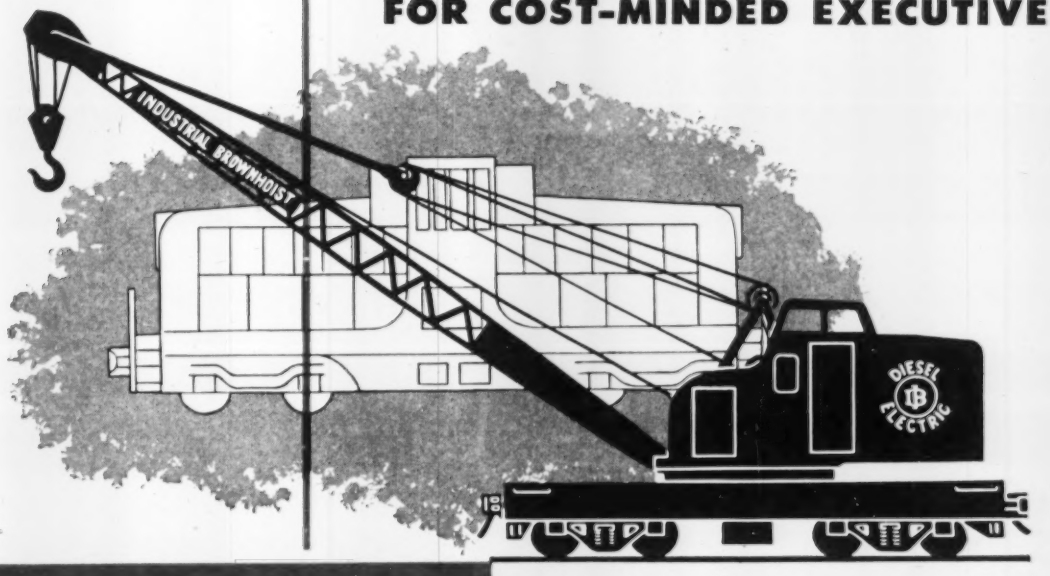

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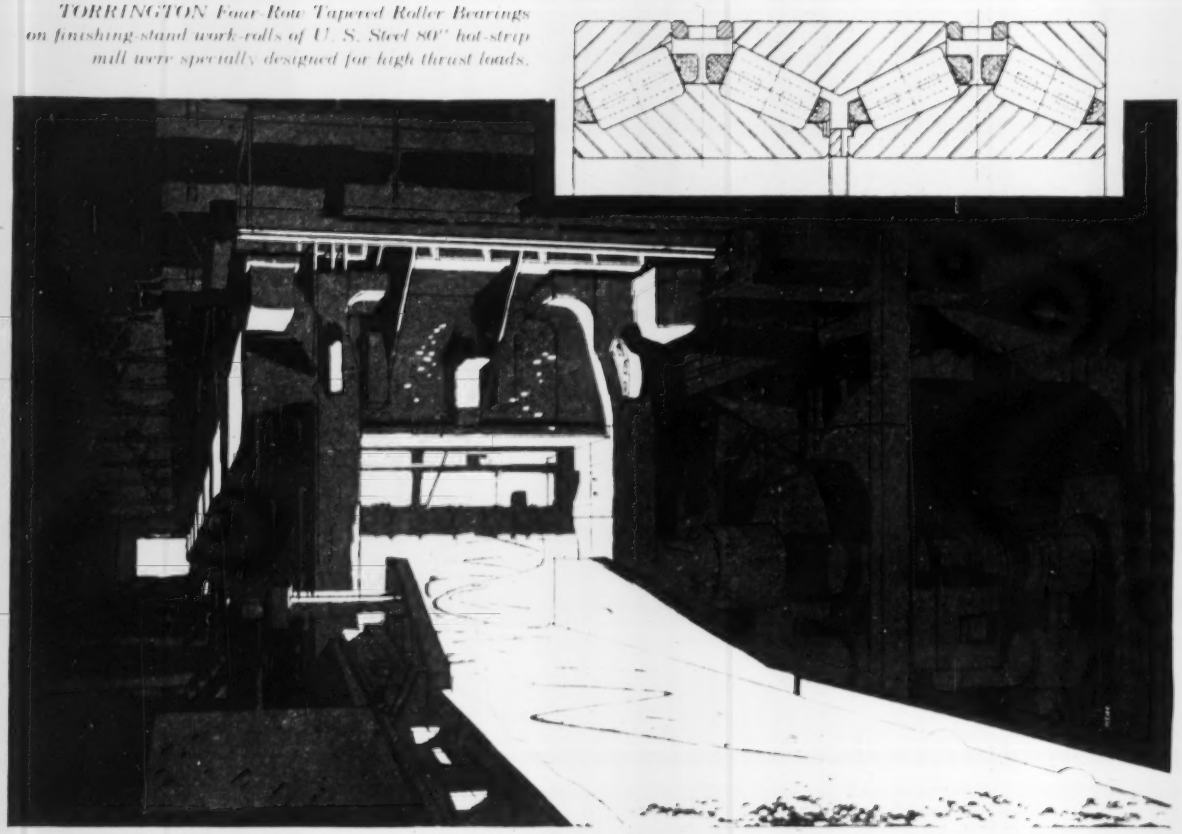

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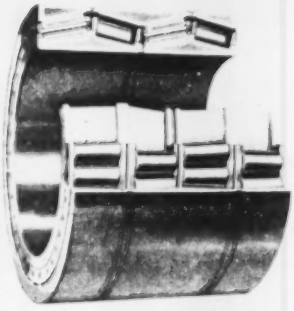

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TABLE II
COMPARISON BETWEEN SHORT-CUT AND SYMMETRICAL COMPONENTS METHODS

Furnace Mva	12	20	12	20
Condenser Mvar	30	30	60	60
Reactor (% on 100 Mva)	50	50	90	105
Sym. Comp. Method, %	1.115	1.36	0.64	0.70
Short-Cut $X_c = X''_d$, %	1.125	1.40	0.604	0.683
Short-Cut $X_c = X'_d$, %	1.30	1.62	0.70	0.92

per cent regulation" are plotted to show the useful range of flicker voltage curves. If a combination of synchronous condenser and buffer reactor is used, such that it results in a point on a flicker curve to the left of the particular limit curve, the steady-state voltage on the 13.8-kv bus will be less than 13.46 kv (13.8-2.5 per cent) with the transformer set for 10 per cent boost. Points lying on these curves actually represent the maximum sized reactor which can be used with a given sized condenser and 10 per cent boost in the transformer without having the voltage on the 13.8-kv bus less than minus 2.5 per cent, assuming rated kvar output from the synchronous condenser, 64 kv on the 66-kv bus, a load of 60-mva at 70 per cent power factor, or 5 mva at 83 per cent power factor.

It will be noted that the flicker curves do not meet the axis of ordinates at the same value when no synchronous condenser is used. This is a result of the assumption that the load swing of the arc furnace could be represented by inserting a constant per cent impedance into the sequence networks. The fact that these points lie relatively close together indicates that this assumption, even if wrong, does not introduce a significant error. It is possible that this assumption is more accurate than assuming that the furnace swing is a constant kva regardless of system impedance.

If a radial load were fed from bus A, the flicker would be as shown in these curves. If, however, lighting load is supplied from a point electrically closer to the source than bus A, the flicker will be proportionately less, depending on the system impedances.

Over and above the flicker considerations, power factor and steady-state regulation must be considered. Figs. 10a and 10b show

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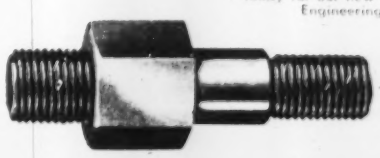

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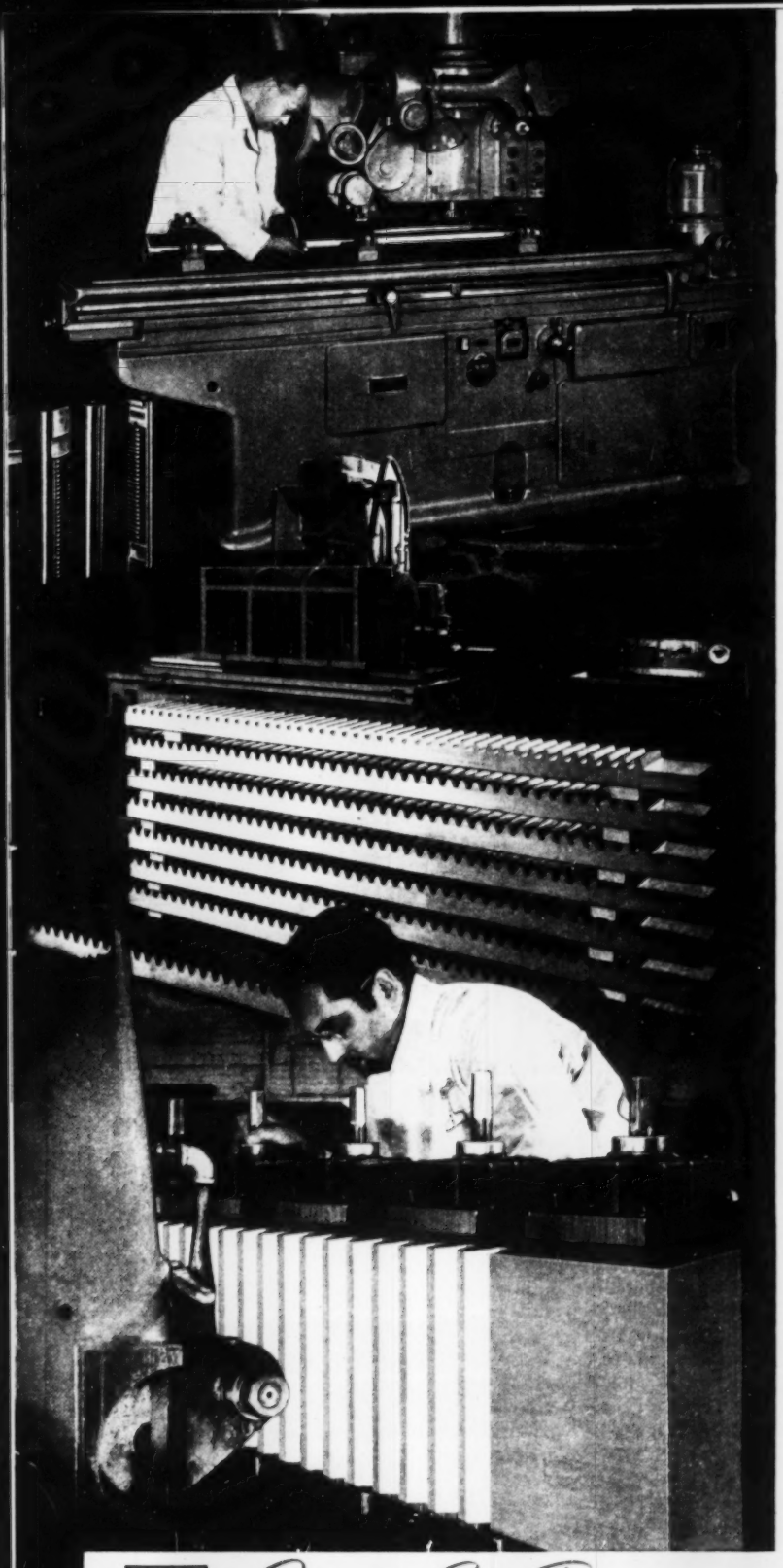
the power factor on bus A using different values of buffer reactor and with two different loads on the 13.8-kv bus. Also noted on this curve are the tap positions necessary to obtain 13.8 kv on the bus with 61 kv on the 66-kv bus. The use of a tap position for a particular operating condition other than that indicated on this curve will result in a voltage change on the 13.8-kv bus proportional to the tap deviation from that indicated on the curves, but the power factor will be substantially unaffected. Conversely, if the bus voltage is maintained within the prescribed limits, the power factor will be substantially that given by this curve.

Using a given size of reactor and limiting a regulation to ±2.5 per cent requires a definite condenser output assuming maximum advantage has been taken of available taps on the transformer. The curves in Fig. 11 show the size of synchronous condenser required with a given reactor.

Stability of the synchronous condenser will be an unlikely problem unless capacitors are used in series with it. However, this possibility was checked. A power angle diagram showing power angle curves for no furnace load and maximum furnace load were drawn. The latter was displaced by the phase shift at the terminals of the condenser with maximum load on the furnace bus. Comparison of these curves showed that the condenser was stable. To cause the condenser to pull out of step, it would be necessary to switch the entire bus load off and on several times at the right frequency.

Evaluation of Short-Cut Method—A comparison between the symmetrical components method and the short-cut method described previously, allows an evaluation of the short-cut method. In the short-cut method, the load swing is assumed to have the same impedance angle as the system which gives the maximum voltage change for a given load swing. In the symmetrical components method, transient reactance was used for the synchronous condenser which reduces its effectiveness (gives a slightly higher voltage change for the same equivalent system impedance).

Table II shows a comparison between the results using both trans-



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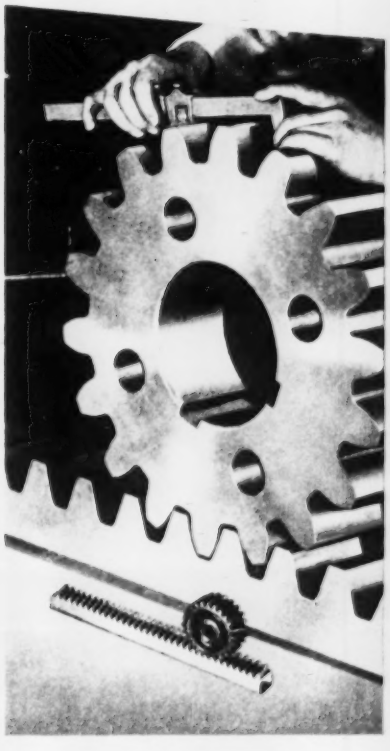

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ient and subtransient reactance to represent the synchronous condenser in the short-cut method.

A sample calculation using the short-cut method in the per unit system follows:

Equivalent system impedance:

$$X_s' = X_s + X_T$$

Equivalent impedance:

$$X_{eq} = \frac{X_c' X_s}{X_c' + X_s}$$

where X_c' = condenser reactance.

Flicker voltage on furnace bus

$$\Delta E_{13.8} = 2 I_L X_{eq} = 2 \left(\frac{\text{Swing Kva}}{\text{Base Kva}} \right) X_{eq}$$

Flicker voltage on bus A

$$\Delta E_A = \frac{X_s}{X_s'} (\Delta E_{13.8})$$

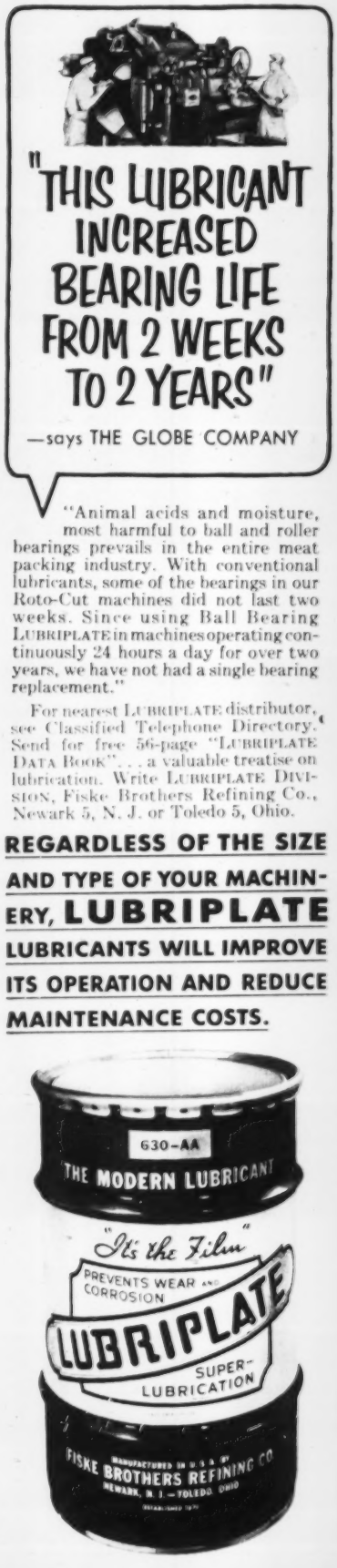
Combining above

$$\Delta E_A = 2 \frac{X_s' X_c}{X_s' + X_c} \left(\frac{\text{Swing Kva}}{\text{Base Kva}} \right) \frac{X_s}{X_s'} = 2 \frac{X_s X_c}{X_s' + X_c} \left(\frac{\text{Load Swing}}{\text{Base Kva}} \right) \times 100 \text{ volts in per cent.}$$

For 12-mva furnace, 30-mva condenser, and 50 per cent impedance, X_T (buffer reactor plus transformer)

$$\Delta E_A = 2 \frac{(0.1295)(1.03)}{0.6295 + 1.03} \frac{(7000)}{100{,}000} \times 100 = 1.125 \text{ per cent.}$$

Conclusions—The application of an arc furnace load to a system is amenable to calculation. The validity of the results and the success of the application depend upon two important factors: (1) The establishment of a voltage flicker limit, and (2) the load swing which is assumed on the arc furnace and is used in calculation of the voltage fluctuations. The short-cut method gives results which compare favorably with the longer symmetrical components method. The results obtained by this method are probably conservative. General corrective measures are illustrated in this paper, and methods of calculation are outlined for application of an arc furnace. There is a need for a direct relationship between light flicker as a function of arc furnace load and system impedance.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Conference paper presented at the general summer AIEE meeting, Minneapolis, June 26, 1952.

Tool Machines Tractor Blocks

Special machine delivered by Cross Co., Detroit, machines tractor cylinder blocks at a rate of 71 pieces per hour, performing at 100 per cent efficiency. Operations include drilling, counterboring and tapping recess for oil filter; drilling, counterboring and reaming two Welsh plug holes; milling, drilling, reaming and tapping hydraulic pump mounting pad; milling, chamfering and tapping all miscellaneous holes on both sides.

The machine has 13 stations—one for loading, one for milling; six for drilling, boring and reaming; one for tapping; four for inspection. Automatic devices incorporated include the chip conveyor, air-oil tap lubricating and cleansing with each cycle, cam clamping and retraction for milling cutters during return stroke.

Core Laminations Described

Greatly expanded descriptions of transformer laminations are presented in the fifth edition of Allegheny Ludlum Steel Corp.'s lamination catalog. Included is technical information and full-size drawings of all the available standard shapes.

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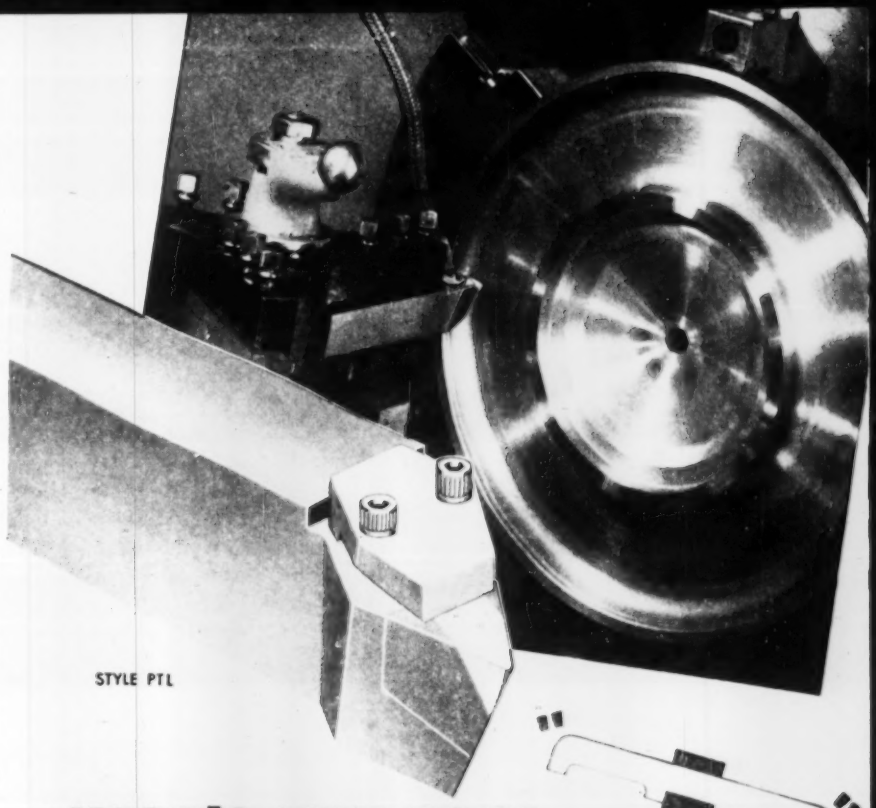
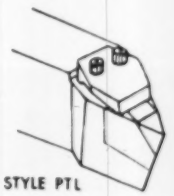
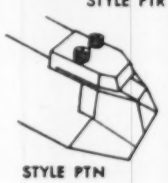


HERE'S THE TOOL *that fits to a*





The right angle chucking lathe, tracer controlled, provides for efficient profile machining of workpieces having large diameter, short length, and thin wall sections, particularly those made of stainless steel and heat-resistant alloys.

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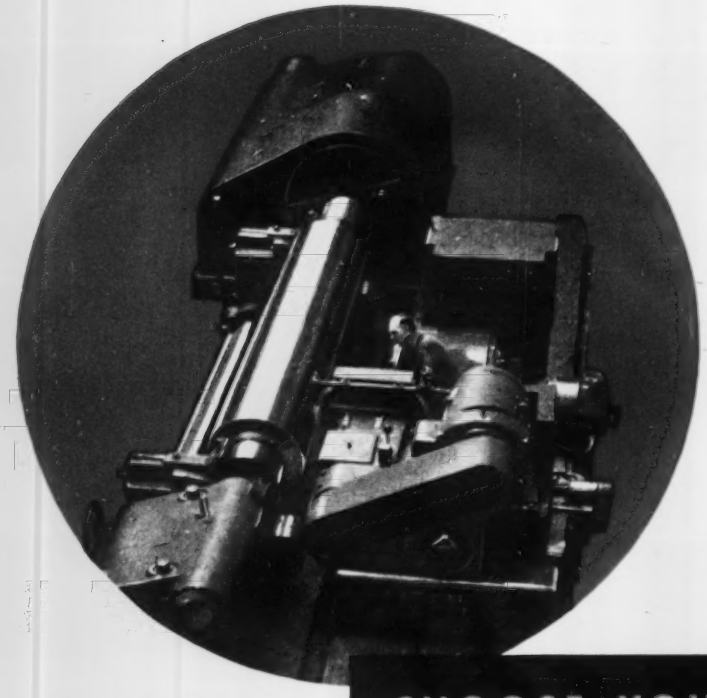

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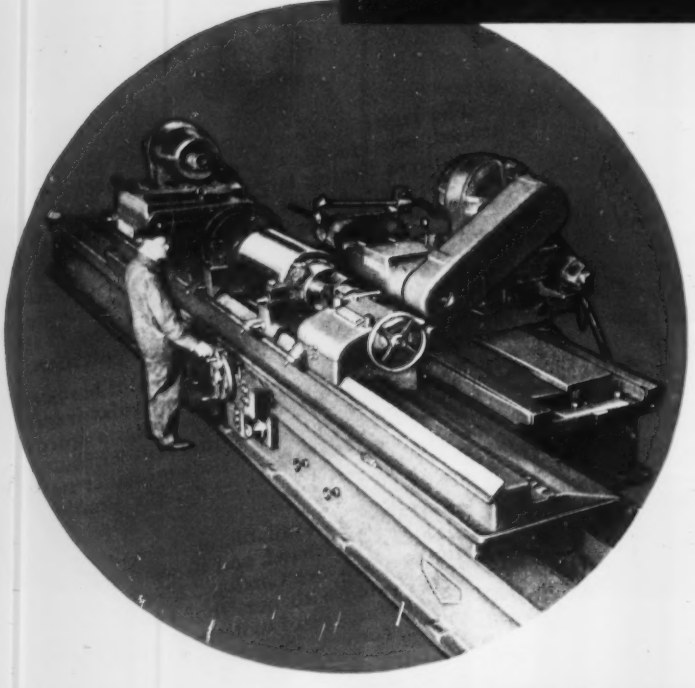

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and a variety of thicknesses, and each is provided with a weight table to assist in ordering. Copies of the catalog are available on request to Advertising Dept., Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22.

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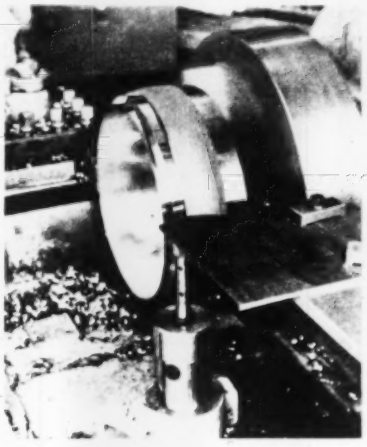
MACHINING difficult contours for guided missile parts at Rheem Mfg. Co., Downey, Calif., is simplified by equipping standard lathes with Turchan followers. Parts are completed in 68 minutes, compared with the 3 hours taken by conventional methods.

In turning inside and outside diameters of these air tank heads, 23 pounds of stock at 12 inches di-



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. . . no adjustment required for size

ameter must be removed from rough forgings of 4130 aircraft steel. This is done to a plus 0.005, minus 0.000-inch tolerance. A full spherical radius is cut inside. The contour starts straight, blends into a $2\frac{3}{4}$-inch radius and blends again into an 8-inch spherical radius.

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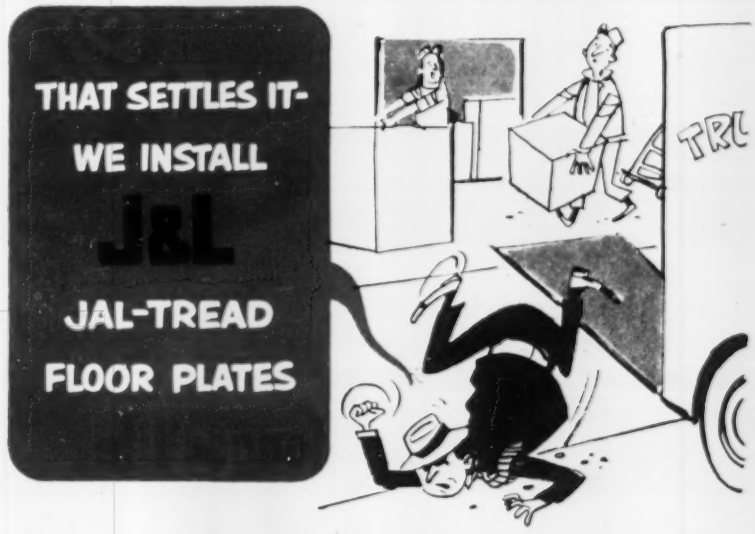

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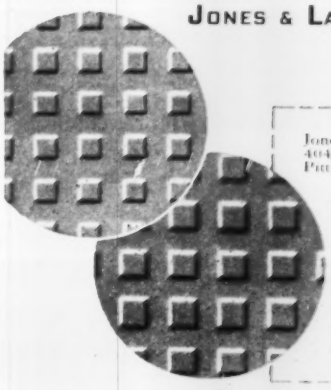

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This testing phase is conducted by use of more than 40 creep machines that apply loads ranging from 2800 to 100,000 psi at 700 to 1800° F. Stresses and temperatures are held constant by automatic controls. Time for the tests varies from 100 hours or less up to 3 years or more. Longest test has been running 3 years at 2800 psi and at 1000° F.

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Haylift for Starving Snow Bound Livestock — Fallon, Nevada — Wide World Photo

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In "The Invisible Background of Industrial Progress" Bullard's * *Modern Machine Tools* play an important part in manufacturing and the maintenance of today's air arm.

* *For greater manufacturing economy REFER to next page*

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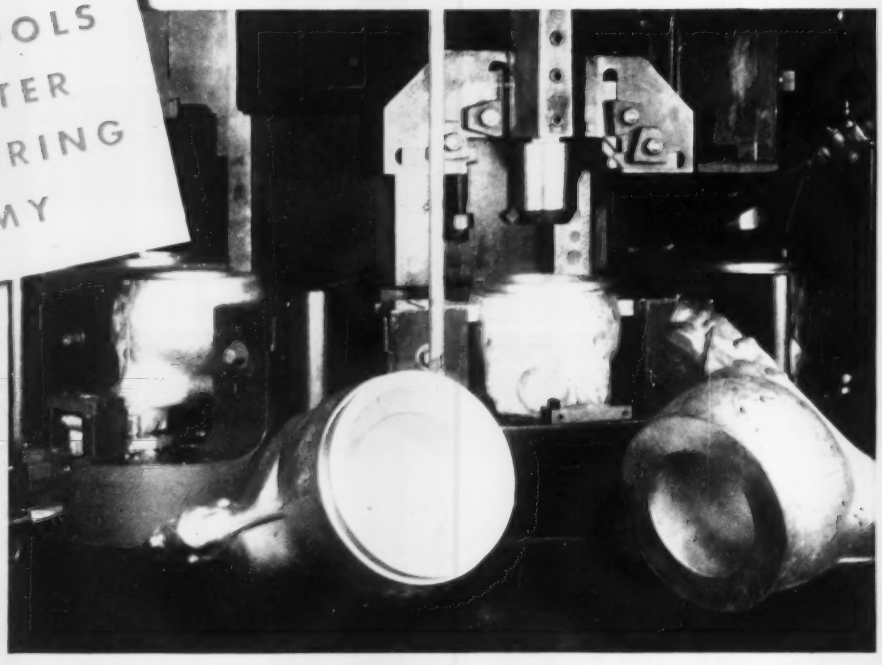
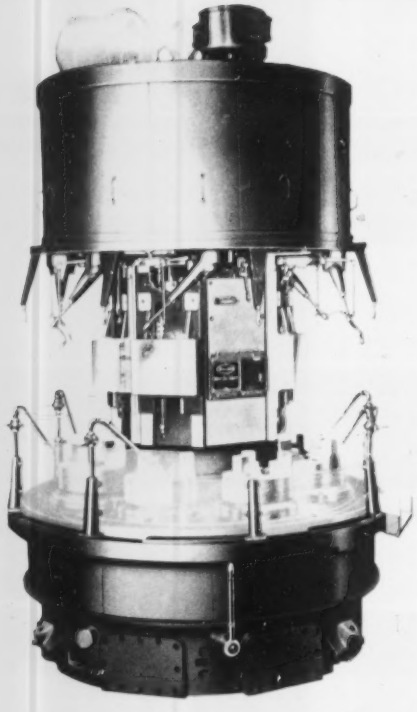


16"—6 spindle type "D" Mult-Au-Matic for production of aeroplane motor forged Cylinder Heads showing sixth and loading stations.



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ifications. Materials that meet ASME boiler specs usually must have at least a 20-year life.

Lever and Screw Types—Newest creep machines used by International Nickel in this program are 34 Baldwin lever-type units with 12,000 pounds capacity, plus one Baldwin screw type. Ten of the lever-type machines are modified by counterweights to balance the weight of the lever system. With this change, the only load on the test system is the added weight suspended from the lever. This works an advantage when using small diameter or sheet metal specimens instead of the standard 0.505-inch diameter piece.

Shock-absorbing dashpots under the loading weights of several machines provide another accessory. Dial-type extensometers are also used in some tests in place of the more accurate instruments supplied with the machine. For all creep tests, electric furnace temperatures are controlled closely by three thermocouples in each furnace. Furnaces have three separate heat zones under separate automatic control.

Materials Range—With the screw-type machine, elongation-versus-time curves are drawn automatically on a chart at the machine top. Chart panel is driven vertically as the specimen elongates, and recorder pen horizontally by a clock mechanism. Load is applied by an electric motor-driven screw and maintained constant by an electric contact with a deflected spring supporting block. This unit is used for short time tests.

Materials tested include the company's more than 50 standard alloys, all new developments in alloys with various heat treatments and any standard alloy modifications for which there are indications of improvement in physical properties.

Galvanizers Get Cost Manual

Members will receive the manual, "Cost Accounting Principles for the Hot Dip Galvanizing Industry," when that association convenes in its annual meeting Mar. 19-20 in Cincinnati. Another informative feature of the program, according to Stewart J. Swensson, secretary-treasurer, will be a demonstration of new drossing equipment.

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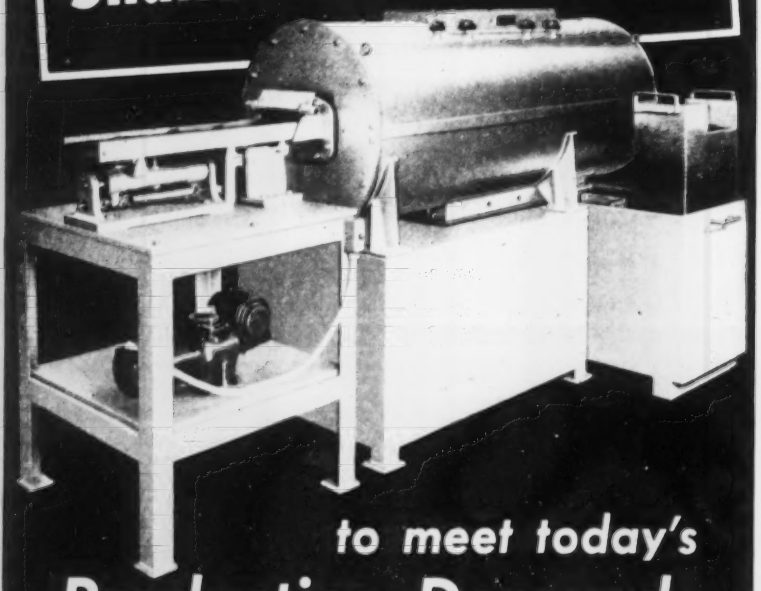

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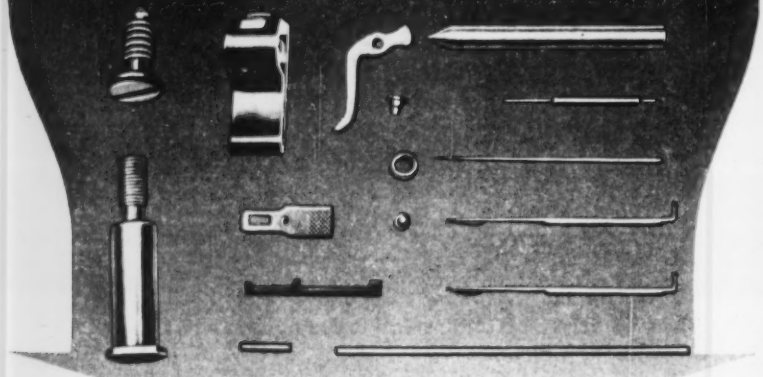

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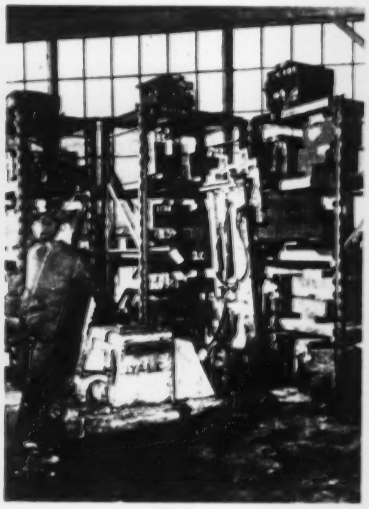
Under the firm's old handling and storing system, dies were stacked two-high, with each pair resting directly on the pair beneath. Each pair of dies was handled by a sling chain from an overhead, short-span chain hoist-



SAWTOOTH RACK SYSTEM
. . . . *trucks work in minimum aisles*

equipped crane. These dies, even though they were placed as closely adjacent to each other as possible, still consumed more than a 6400-sq ft storage area.

Not only was it difficult to keep track of the dies, but sometimes as many as four or five stacks had to be moved to get at the unit required for a specific job. All storage was out-of-doors, which meant that dies had to be thoroughly greased. At times during the winter, ice locked dies together, increasing handling difficulties.

Special Racks — The company's new storage system provides specially-designed racks for die stacking. These are placed on both sides of the aisle in a saw-tooth arrangement. The 45-degree stacking arrangement allows Yale & Towne

Here at Sterling Bolt Co., a single, integrated DEPENDABLE source can supply you with more than **200,000** stock and standard sizes in Bolts, Nuts, Screws and Washers for your specific needs.

For more than 35 years Sterling Bolt has been a prime supplier of metal fastenings to America's best-known companies—because Sterling facilities combine both warehouse and mill, giving you advantages of **PROMPT SERVICE** and **COMPETITIVE DISCOUNTS.**

try these for SIZE

THE INDUSTRIES WE SERVE— AND SERVE WELL!

Refrigeration • Pumps • Cranes • Elevators • Tractors • Trailers • Conveyors • Mining Equipment • Blower & Fan Equipment • Diesel Engines • Bodies—Motor Truck & Trailer • Electrical Manufacturing • Air Conditioning • Material Handling Equipment • Machinery Manufacturing • Radio & Television • and many others—

Interested in Cutting Costs?

No need to count on expensive, time-consuming specials when Sterling Bolt Standardized Bolts, Nuts and Screws can fit your job—200,000 to one!

Send your inquiry or order TODAY—to the

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The over-all job in

Production Lines and Special Automatic Machines

by

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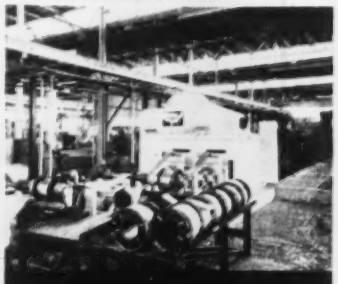
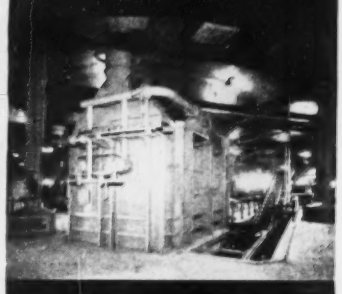
for military production...

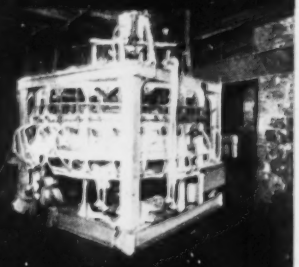


Continental Automatic Strip Production Line consisting of annealer, pickling machine, dryer, and coiler.



Continental Special Automatic Pig Molding Machine complete with automatic charging, melting, and pouring.

Continental Automatic Production Line operating from raw materials to completely finished and packed product. This production line consists of fifteen integrated, synchronized, special automatic machines.



Continental Special Automatic Glazing Machine complete with automatic press, synchronizer and fire polisher.

For maximum production of military items manual operations must be eliminated. With CONTINENTAL Special Automatic Machines and Integrated Production Lines production goes on in a continuous flow with better, more uniform products with a minimum of man hours.

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PRODUCTION LINES

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SPECIAL MACHINES
COMPLETE PLANTS

MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

Worksaver trucks to operate in a minimum width aisle and facilitates handling dies in storage area.

Dies being handled are matched, male and female, and dovetailed to index on the anvil and hammer ram. This dovetail provides an opportunity for the lift with adjustable forks to pick up each pair of dies and transport the units to and from storage without pallets. Individual loads run as high as 3260 pounds. Each shelf is capable of storing 7800 pounds.

Flush Stacking—The trucks' side shifting arrangement further conserves time and space by making it possible for the operator to shift his load right or left without jockeying the truck. The shifter also means the operator can work with a smaller turning radius.

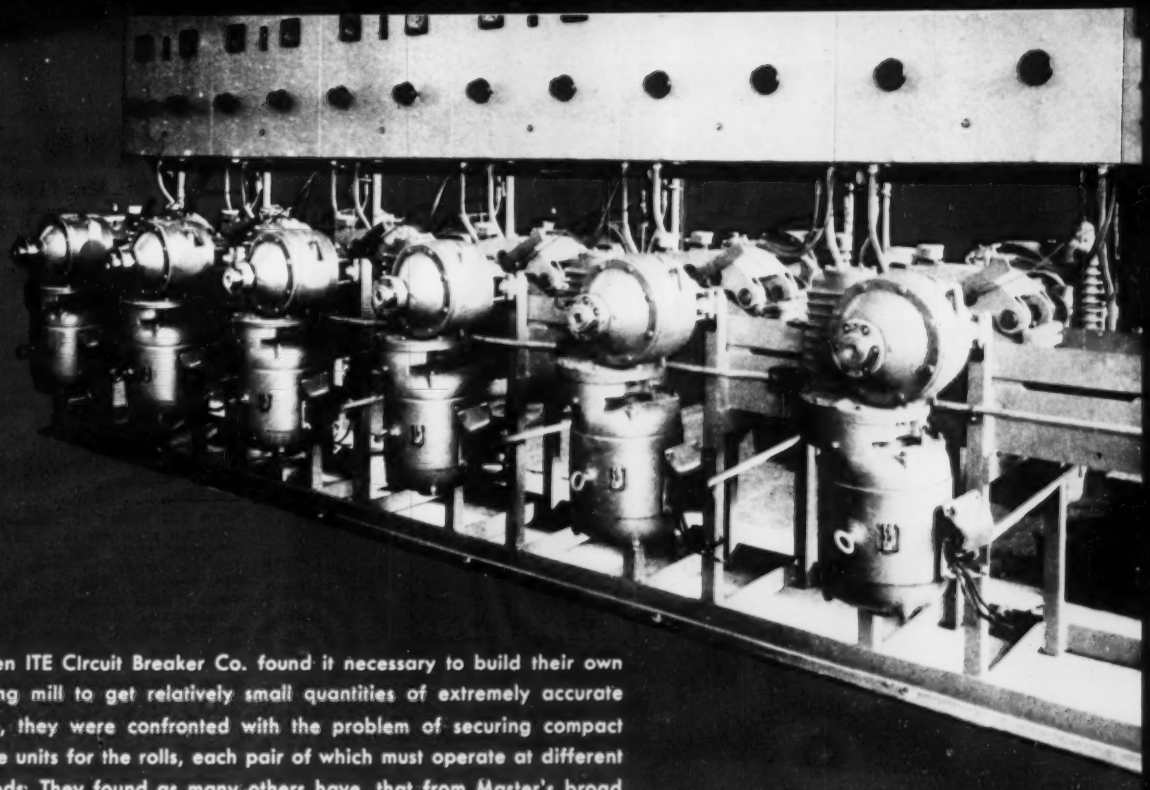
Pittsburgh Forgings estimates time and money saved by its new system only as "substantial." However, space saved is subject to a more specific gage. A storage area that formerly covered 6400 sq ft now requires a tidy 1600 sq ft of floor space.

Atomic Tracers Test Cleaners

Nuclear research that may help develop improved prefinishing cleaners and new protective and decorative coatings is a project announced by Diversey Corp., Chicago. Radioactive isotopes purchased from the government's atomic pile and equipment for measuring their presence and radiation will be employed to test effectiveness and behavior of metal cleaners.

In testing cleaning compounds, for example, tagged or radioactive carbons are incorporated into soil, then the soil is spread on a surface to be cleaned. On what appears to be a clean surface, small amounts of radioactive soil can be detected by the electronic equipment. If no count can be measured, it indicates effectiveness.

The new eqiupment and methods will serve further than determining effectiveness of cleaners in preparing surfaces for electroplating. Diversey expects the research technique to solve such problems as determining corrosion or absorption of inhibitive chemicals and effect of impurities in the plating solution.



When ITE Circuit Breaker Co. found it necessary to build their own rolling mill to get relatively small quantities of extremely accurate strip, they were confronted with the problem of securing compact drive units for the rolls, each pair of which must operate at different speeds. They found as many others have, that from Master's broad line of Gearmotors they could select standard units which would give them the RIGHT horsepower, the RIGHT shaft speed in one compact unit that they could use RIGHT where they wanted it.

Probably you will never design a rolling mill. But the next time you need motor drives for your plant or product, remember that Master Motors, available in thousands and thousands of types and ratings, give you a selection you can get nowhere else.

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Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

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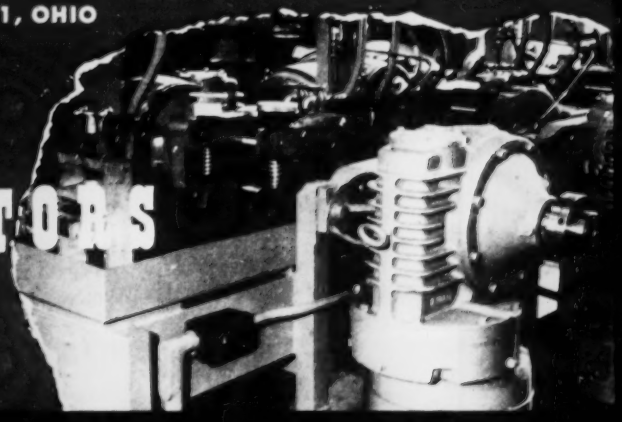

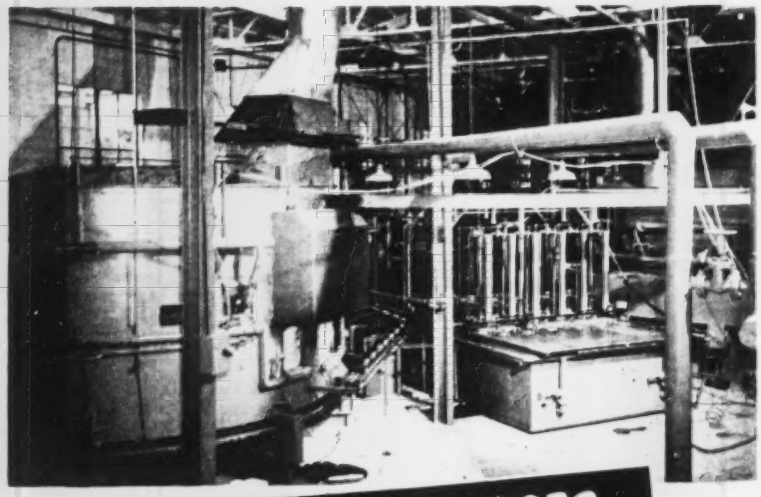

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your assurance of accurate, uniform heating

In the production of 105 mm shells, accuracy and uniformity of heating are of vital importance. To obtain necessary tolerance, without the use of valuable alloys, two Gasmaco furnaces are employed — one for hardening and the other for drawing. A quench tank is located between the furnaces on this operation, which requires the services of only two men.

The shells are hardened, quenched and drawn in a vertical position to ensure positive uniformity and accuracy. The result is better quality, faster production and lower cost.

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CALENDAR
OF MEETINGS

March 2-6, American Society for Testing Materials: Spring meeting, Hotel Statler, Detroit. Society address: 1916 Race St., Philadelphia. Secretary: Robert J. Painter.

March 2-6, Pittsburgh Section, American Chemical Society and Spectroscopy Society of Pittsburgh: Pittsburgh conference on analytical chemistry and applied spectroscopy. Hotel William Penn, Pittsburgh. Information: L. E. Pitzer, U. S. Steel Co., 525 Wm. Penn Place, Pittsburgh 30.

March 3, Open Steel Flooring Institute: Annual meeting, Hotel Drake, Chicago. Institute address: 1506 First National Bank Bldg., Pittsburgh 6. Secretary: Stuart J. Swensson.

March 3-5, Society of Automotive Engineers: National passenger car, body and materials meeting, Hotel Sheraton-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 4, Steel Kitchen Cabinet Manufacturers Association: Quarterly meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

March 6, Bituminous Coal Research Inc.: Annual meeting, Netherland Plaza hotel, Cincinnati. Institute address: 2600 First National Bank Bldg., Pittsburgh 22. Secretary: C. A. Reed.

March 8-11, American Institute of Chemical Engineers: Annual spring meeting, Hotel Buena Vista, Biloxi, Miss. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

March 11, Foundry Education Foundation: Annual meeting and technical, university & industry advisory committee conference, Hotel Cleveland, Cleveland. Foundation address: Terminal Tower, Cleveland 13. Executive director: George K. Dreher.

March 11-12, Society of the Plastics Industry Inc.: Annual Canadian conference, General Brock hotel, Niagara Falls, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 15-19, American Chemical Society: Spring meeting, Hotels Statler and Biltmore, Los Angeles. Society address: 1155 - 16th St. NW., Washington 6. Assistant secretary: R. M. Warren.

March 16-18, National Association of Waste Material Dealers: Annual meeting, Hotel Conrad Hilton, Chicago. Association address: 271 Madison Ave., New York 16.

March 16-20, National Association of Corrosion Engineers: Annual conference, Hotel Sherman, Chicago. Association address: 918 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

March 16-20, National Association of Manufacturers: Institute on Industrial Relations, Hollywood Beach hotel, Hollywood-by-the-Sea, Fla. Association address: 14 W. 49th St., New York 20. Director, employee relations division: Sybil S. Patterson.

March 17-18, Steel Founders' Society of America: Annual meeting, Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

March 18-20, American Society of Tool Engineers: Annual meeting, Hotel Statler, Detroit. Society address: 16700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

March 19, National Industrial Conference Board: General session, Netherland-Plaza hotel, Cincinnati. Board address: 247 Park Ave., New York. Secretary: Clyde L. Rogers.

March 19-20, Porcelain Enamel Institute: West Coast conference, Hotel Statler, Los Angeles. Institute address: DuPont Circle Bldg., Washington. Secretary: John C. Oliver.

March 19-20, American Hot Dip Galvanizers Association Inc.: Annual meeting, Netherland Plaza hotel, Cincinnati. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart Swensson.

March 23-27, American Society for Metals: Western metals congress & exposition, Pan-Pacific Auditorium, Los Angeles. Information: 7619 Beverly Blvd., Los Angeles. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

March 23-27, National Association of Power Engineers Inc.: Annual spring meeting and exhibit, Hotel Sherman, Chicago. Association address: 176 W. Adams St., Chicago 3. Secretary: A. F. Thompson.

March 25-27, Pressed Metal Institute: Annual meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland 20. Managing director: Orrin B. Werntz.

March 25-27, Society of Automotive Engineers: National production meeting, Hotel Statler, Cleveland. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 26-27, Instrument Society of America and Carnegie Institute of Technology: Iron & steel instrumentation conference, Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

March 31-April 2, The Magnesium Association: International magnesium exposition, National Guard Armory, Washington. Association address: 122 E. 42nd St., New York 17. Secretary: Martha I. Hanson.

April 7-9, Steel Shipping Container Institute: Annual meeting, Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 8-10, Society of the Plastics Industry Inc.: Pacific Coast conference, Last Frontier hotel, Las Vegas, Nevada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

April 9-10, Malleable Founders' Society: Market development conference, Cornell University, Ithaca, N. Y. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

April 9-11, Lead Industries Association: Annual meeting for members, The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 12-15, American Supply & Machinery Manufacturers Association: Annual meeting and conference booth program, Hotel Columbus, Miami, Fla. Association address: 811 Clark Bldg., Pittsburgh 22. Secretary: R. Kennedy Hanson.

April 12-16, Electrochemical Society Inc.: Annual spring meeting, Hotel Statler, New York. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

April 13-15, International Acetylene Association: Annual spring meeting, Hotel Biltmore, Atlanta. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13-15, American Society of Lubrication Engineers: Annual meeting and exhibit, Hotel Statler, Boston. Society address: 343 S. Dearborn St., Chicago 4. Secretary: William P. Youngclaus Jr.

April 13-16, National Industrial Conference Board: Annual meeting for members, Miami, Fla. Board address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehart.

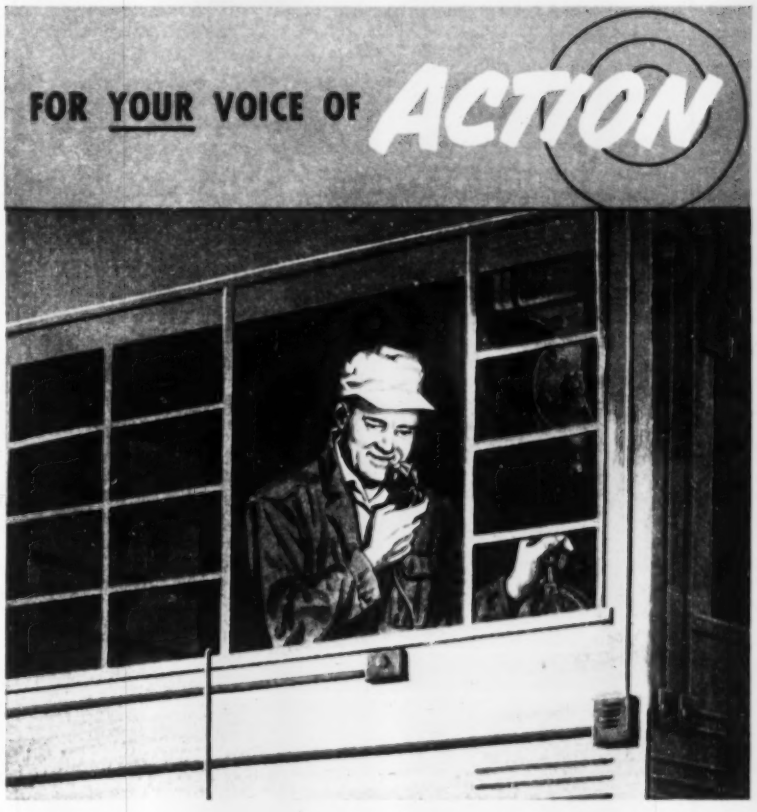
April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernely Jr.

April 16-19, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, re F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Sherman, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

April 19-23, American Hardware Manufacturers Association: Spring meeting, Hotel Adolphus, Dallas. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.



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provide low cost
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Efficiency is improved—production goes up, when Femco equipment is installed. With Cranephones, you can talk from cab to floor, to office, and from cab to cab.

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IRWIN, PENNSYLVANIA

Ask for YOUR Femco Data Kit

Specialists in Electronic Communication and Control

MEN OF INDUSTRY

(*Continued from Page 82*)

its product service division. **George A. Carlson** will be manager of the new branch.

Oliver United Filters Inc., San Francisco, elected **Francis T. Letchfield** to its board of directors, replacing **John B. Keating**, retired.

James R. McCutcheon Jr. was appointed sales manager, valve division, **Homestead Valve Mfg. Co.**, Coraopolis, Pa. For the last seven years he served as district representative for American Car & Foundry Co.'s valve division.

J. W. Everson was appointed assistant manager of **Dow Chemical Co.'s** market research department, Midland, Mich.

Richard E. Reiter was named superintendent of the landing gear division of **Willys-Overland Motors Inc.**, Toledo, O. In accepting the Willys' position, Mr. Reiter resigned as general manager, secretary and board member of Leading Engine Co., Farmington, Mich.

GEORGE L. COBB
. . . . gen. sales mgr. for Soule Steel

George L. Cobb was promoted to general sales manager, **Soule Steel Co.** He succeeds **E. B. McClure**, who has advanced to assistant to the president in addition to being vice president. Mr. Cobb will have headquarters in San Francisco, Mr. McClure in Los Angeles.

Youngstown Sheet & Tube Co. transferred **Frank C. Sterling** from Youngstown to the Pittsburgh district sales office.

Harold M. Patterson was named manager of engineering for the plastics department of **General Electric Co.'s** chemical division, Pittsfield, Mass.

Howard R. Silverthorn was named plant engineer and **N. R. Gorris** master mechanic at **Chrysler Corp.'s** Trenton, Mich., engine plant.

L. C. Perkinson was elected vice president and **G. C. Walker** as treasurer, **American Cyanamid Co.**, New York.

Latrobe Steel Co., Latrobe, Pa., appointed **C. W. Barnthouse Jr.** as assistant district manager of its Los Angeles sales office and warehouse. He was transferred to the West Coast offices of Latrobe in 1950, and since that time has en-

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COMPONENT PARTS
Eliminate the designing and making of clamps and other fixture parts. LODDING makes them for you.
LARGE FACTORY AND DISTRIBUTOR STOCKS ASSURE QUICK DELIVERIES.
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showing 365 items that can save you time and money.
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Dust, Grit, Fog or Fumes
CAN'T GET UNDER THE "SKIN"

of your Century

TOTALLY
ENCLOSED
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COOLED MOTORS

The inner frame of your Century TEFC Motor completely seals all the vital working parts against air-borne hazards. An effective stream of air blown between the inner and outer frames, keeps the motor temperature within safe limits at rated load.

Century TEFC motors operate your equipment efficiently in any kind of atmosphere — resist dusts, dirt, chemical or oil fog, and mists.

Whatever the job or working conditions, Century's wide line of types, sizes, and variety of operating characteristics, enables you to select the motor specifications for top equipment performance.

⅛ to 400 horsepower ratings — A.C. or D.C. — Furnished in Drip Proof — Splash Proof — Dust Proof — or Explosion Proof frames — for most all atmospheric surroundings.

Specify Century motors on your new equipment or replacements. Your nearby Century District Sales Office or Century Distributor will be glad to give you full information.

Century C MOTORS

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Euclid Cranes prove an important link in the chain of operations required to convert incoming materials into outgoing products in a vast number of manufacturing plants.

Facility of movement through ease of precision control enables "Euclids" to handle a large variety of production operations, and to readily "pace" the assembly line. Write us concerning your crane problems. We'll be pleased to submit a proposal.

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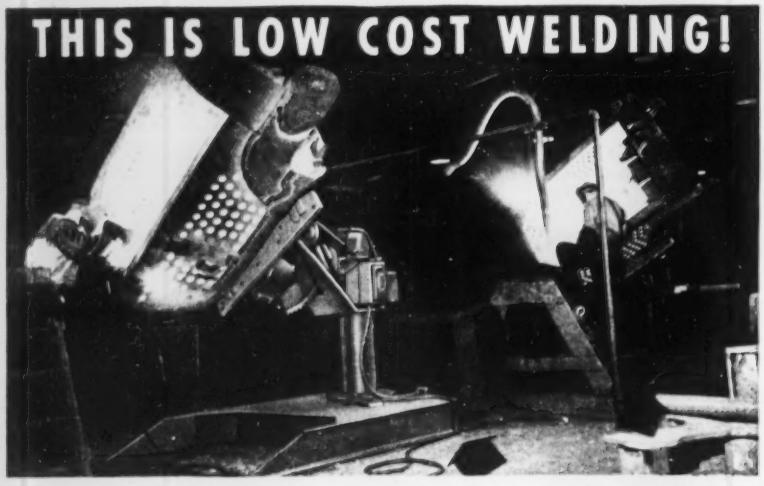
THIS IS LOW COST WELDING!



When a touch on a button moves weldments like these into the correct, most convenient position for a downhand pass, you get more arc time, more welding at lower cost. C-F power operated Positioners rotate the work in a full circle at any point in a range of 135° from the horizontal giving welders a choice of an infinite number of downhand welding positions instantly.

Every requirement for faster, better positioned welding constant or variable speed table rotation, full 135° tilt, self-locking gearing which holds the table in any position, oversize built-in main tilt and rotating bearings, choice of two base styles, and many other features are built into C-F Positioners.

C-F Positioners are available in Hand or Power operated models, and are made in capacities up to 30,000 lbs. and larger.

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C-F positioned welds mean better, more economical welds

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

DAVID C. WALKER
Federal Steel Warehouse V. P.

gaged in both sales and metallurgical service throughout the Los Angeles area.

David C. Walker was appointed vice president, **Federal Steel Warehouse Corp.**, Dayton, O. He previously was with Oliver Corp.'s Springfield, O., plant in the capacity of purchasing agent.

Vincent J. Volpe was appointed a research engineer in the propulsion and structural research department at **Armour Research Foundation**, Illinois Institute of Technology, Chicago.

Thomas E. Berry was named to cover the New York territory for **DeWalt Inc.**, Lancaster, Pa.

Vere Wiesley was appointed manager of **American Can Co.'s** Los Angeles plant. **William Flynn** was made assistant district sales manager at Los Angeles.

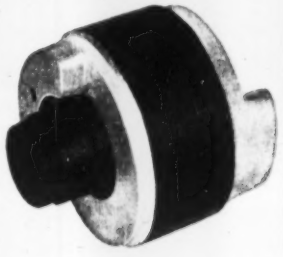
William C. Robinson was named director of industrial relations and a member of the management committee at **Lukens Steel Co.**, Coatesville, Pa. He has served as acting director since September.

W. C. Safford was appointed assistant division superintendent, hot and cold strip and sheet mills at the Midland Works, **Crucible Steel Co. of America**, Pittsburgh. **Alex DeBlander**, formerly with Universal-Cyclops Steel Co., was appoint-

Closer Temperature Control, Cleaner Aluminum, Cooler and Less Congested Conditions Are Obtained With

AJAX TAMA-WYATT *Induction Furnaces*—

Thousands of die cast rotors for hermetic motors are made from pure aluminum poured from a battery of AJAX Electric Induction Furnaces installed in the St. Louis plant of the Emerson Electric Mfg. Co. Two of these furnaces are shown in the photograph at right.



Close-up of die-cast aluminum rotor which is pressed onto the compressor shaft extension used in refrigeration units.

Our electrical industry produces fractional horse power motors at the rate of 20 to 25 millions per year. After World War II the leading manufacturers changed from fabricated copper rotors to cast aluminum rotors. In this operation, aluminum of high purity under closely controlled temperature is required. In many cases the machines had to be placed right on the assembly line, with severe space restrictions and, of course, with rigid requirements for reliability. AJAX induction furnaces and AJAX automatic pouring units were selected for this job in almost all the plants which switched from copper to aluminum rotors.

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AJAX ENGINEERING CORPORATION, TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

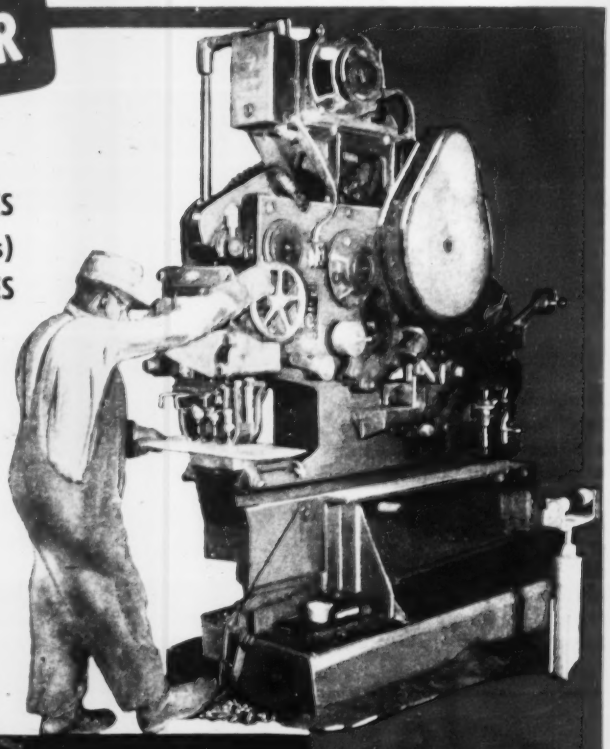
AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP.,
AJAX ELECTRIC CO., INC.,
AJAX ELECTRIC FURNACE CORP.,

SAVES • SPACE • TIME • MONEY . . . by multiple fabrication operations

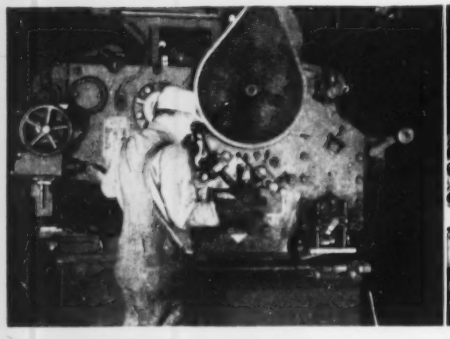
"Buffalo" UNIVERSAL IRON WORKER

• PUNCHES
• CUTS (bars, angles)
• SHEARS • COPES • NOTCHES

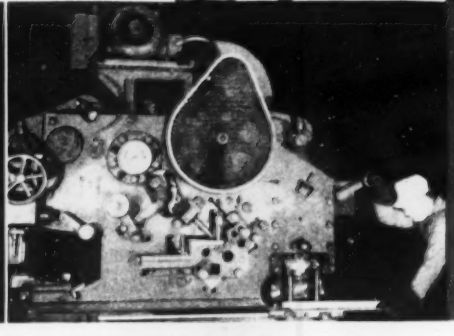
Why give space to five machines to do the operations above, when this one machine can do them all? And it can handle up to three operations at once! Think of the space, time and money this powerful, versatile machine can save in your shop. Write for Bulletin 960D and see the five models available to speed up fabrication on your angles, tees, flats, channels, rounds and squares!



Punching 13/16" holes in 1" steel with triple punching attachment.



Cutting a 6 x 6 x 5/8" angle.



Slitting a 5/8" tee.

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DIAMOND JUBILEE 75TH ANNIVERSARY

DRILLING PUNCHING SHEARING CUTTING BENDING

FRED RIMMLER
. . . John Volkert Metal Stampings plant mgr.

ed superintendent of the cold strip and sheet department, Midland Works.

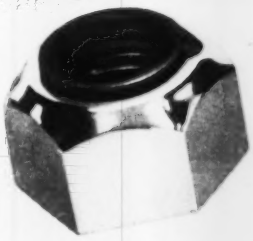
Fred Rimmler was appointed plant manager of **John Volkert Metal Stampings Inc.**, Queens Village, Long Island, N. Y. Associated with Volkert since 1949, he formerly was with RCA Mfg. Co. Inc.

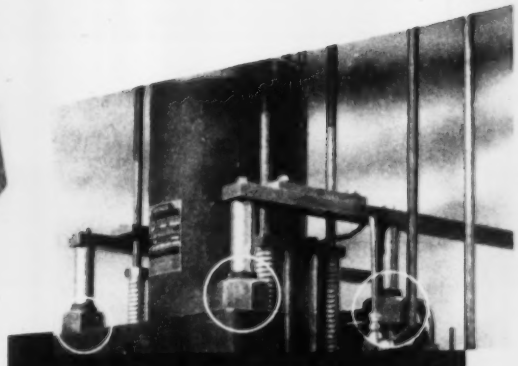
Odin A. Sundness was elected a vice president in charge of mining operations of **Snyder Mining Co.'s** properties in Minnesota. Associated with Shenango Furnace Co. and Snyder Mining since 1911, he has been general manager of operations since 1946.

Dwight W. Bloser, formerly chief engineer, was named vice president, **Transicoil Corp.**, New York. He will supervise the design, engineering and production of control motors, gear trains, induction generators, servo amplifiers and synchros.

H. J. Howerth Jr. was named assistant sales manager, Wayne division of **Gar Wood Industries Inc.**, Wayne, Mich. He served as chief sales engineer until recall to military service two years ago.

W. B. Moore was named manager, chemical and petroleum market sales, **Reynolds Metals Co.**, Louisville. **Wharton L. Donaldson** was named manager of packaging sales, central region, Chicago, and **Hugh Bynum** as manager, general packaging market, with headquarters in Louisville.





HOLDING THE PRESSURE LINE WITH *Security*

THE illustration above shows three of the four large Security Locknuts used on the tie rods of one of the many models of the F. J. Stokes Machine Company's fully automatic Plastic Molding Presses. These Security Nuts must maintain their accurate adjustment against the extreme pressures developed by the movable platen.

The interesting thing about Security Locknuts lies in the locking feature. With Security the load is carried by the body of the nut itself not by the *Locking Insert.*

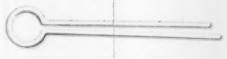
Security Locknuts are vibration proof. They are installed like an ordinary nut. Nothing to adjust—no extra parts—no holes to weaken rods or bolts—nothing to shear—and a Security Nut does not require bolt tension to hold it." It stays "put" where you wrench it at any point on the bolt.

More important than anything else they can be removed and replaced, not once—not fifteen or twenty times—but *any number of times!* Authoritative tests have proved Security Locknut holding power.

Challenge us to solve your toughest fastener problem and ask to see these tests. **Send the coupon.**

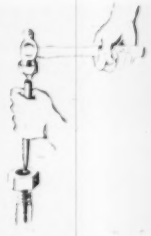
WHAT IS YOUR TOUGHEST FASTENER PROBLEM?

That is the one we want to help you on. Security fastener experts have a long range of experience in problems where other fasteners would not hold. Challenge us to make it stick!



ARE YOU COTTER CONSCIOUS?

There may be places where cotters are the only solution but cotters are expensive to install. Security Locknuts eliminate the adjustment of expensive castellated nuts, chilling and weakening bolts and setting cotters. You install Security just like an ordinary nut.



WHY DESTROY THE BOLT?

Battered up bolt ends mean tough maintenance for your customer. Why peen bolt ends when you can lock the part in place in half the time and still permit easy removal.

ONE NUT DOES IT!

With Security it takes only one nut to hold the job. Just put it on like an ordinary nut. The Security retainer holds it in place and the nut body takes the load. Ask for more complete details. Let us tell you how it's made.

THE SECURITY STUDLOC

The Security Studloc can be adapted to provide a positive lock in counterbores and housings or it can be keyed into work to serve as a simple lock nut. An elliptical, heat treated spring retainer of highest quality spring steel forced into "round" an installation grips the bolt with a force that defies vibration.

THE SECURITY CAPLOC

Here is a cap nut that locks with the grip of the Security Locknut. It provides locking power at a cost no more than an ordinary acorn nut. Here is the answer to those locations where you want to be sure that protection for bolt ends stays there.

Security
The Nut You Can't Shake Loose

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.

Please send me without obligation:

☐ One of your Thread Tolerance Charts

☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name
Address
Town Zone State
Signed

The U. S. Steel Supply team that gives you

personalized service

Here's your *"special secretary"* to speed your steel supply business

OUR receptionist is usually your first contact when you phone or visit U.S. Steel Supply. You will find her friendly and courteous, and anxious to attend to your steel supply business as quickly and efficiently as possible. She is thoroughly acquainted with our system of team operation, and if you want the assistance of a specialist to handle your specific inquiry, she will direct you to the right one. She knows where to contact your U.S. Steel Supply salesman in an emergency, and will follow up your messages to assure prompt call-backs.

When you want steel, tools, equipment, machinery or information *fast*, call U.S. Steel Supply. You'll always get prompt action from people who take a personal interest in giving you the best steel supply service.

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HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. WAREHOUSES AND SALES OFFICES:
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TULSA · YOUNGSTOWN

USS

UNITED STATES STEEL

NEW PRODUCTS and equipment

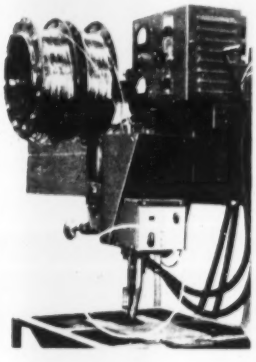
Reply cards on page 149 will bring you more information on any new products and equipment in this issue

Submerged Arc Development

. . . feeds two small electrodes

A development in application of hidden arc welding calls for two small electrodes to replace a single larger electrode to speed the work a reported 50 per cent. The two electrodes are fed simultaneously through a single head and single jaws, both electrodes depositing metal in the weld crater. Higher currents possible with this setup increase metal deposition, amount of penetration and, as a result, welding speeds.

A special electrode jaw, wire feed rolls and guides adapt any of



the manufacturer's standard weld heads for use in this Twinarc setup. Currents up to 1500 amp can be applied. The two-wire head feeds electrodes 5/64, 3/32 and 1/8-inch diameter. Lincoln Electric Co., Dept. ST, Cleveland 17, O.

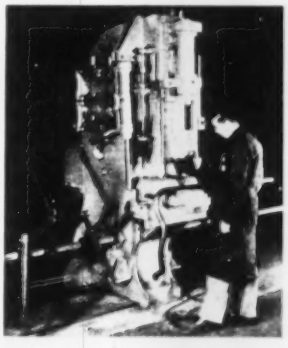
USE REPLY CARD—CIRCLE No. 1

Tube and Pipe Bending Press

. . . rated capacity: 20 tons

Vertical ram-type tube and pipe bending press handles a variety of multiple bends in different planes. Press is fully hydraulic, self-contained, with 20-ton rated capacity. Design features include twin equalizing cushion cylinders offset on the press frame, automatic angle-of-bend cycling with automatic return to starting position.

The press has adequate power and capacity for repeat bending of $\frac{1}{2}$ through 2-inch OD steel tubing with maximum wall thickness of

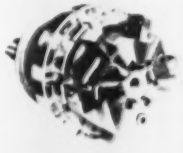


0.083-inch without excessive flattening, wrinkling or distortion. Clearance is sufficient to bend a 2-inch tube with a 5-inch centerline radius to 180 degrees. Pines Engineering Co. Inc., Dept. ST, 601 Walnut St., Aurora, Ill.

USE REPLY CARD—CIRCLE No. 2

Tap Head Adaptation

. . . four jobs with one chucking



Special adaptation combines boring, counterboring and facing blades with conventional tap chasers in a 7-inch ALT tap head. Design gains maximum production with reductions in handling cost because the workpiece can be bored, counterbored, faced and tapped with one chucking.

First three operations are completed with tap chasers collapsed. When tap is withdrawn from workpiece, chasers are expanded. Thread is then tapped on the surface previously bored. A lead screw feed is recommended for both tapping and boring operations to assure long tool life and quality finish. Landis Machine Co., Dept. ST, Waynesboro, Pa.

USE REPLY CARD—CIRCLE No. 3

Protractor

. . . for welding positioners

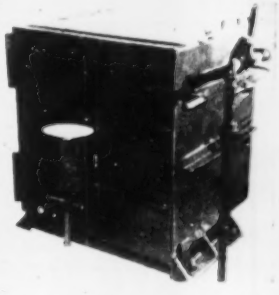
Model PRO protractor is a quadrant marked off in degrees from 0 to 135 in 5 degree steps. It is attached to the tilt trunnion on the control side of the welding positioner. Precise tilt angles are thus easily obtained every time table is tilted. Aronson Machine Co., Dept. ST, Arcade, N. Y.

USE REPLY CARD—CIRCLE No. 4

Water-Cooled Casting Machine

. . . complete temperature control

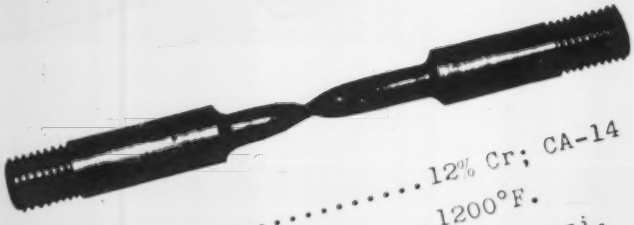
This water-cooled centrifugal casting machine is made in six different sizes covering a casting range from 1 inch ID to 16 inches



OD and to 60 inches long. Permanent molds are made of ordinary steel tubing. The molds can be removed from the machine quickly to change casting size by opening the hinged top cover.

Because the mold is cooled by water sprays, complete control of

DURALOY



Test Rod.....12% Cr; CA-14
Test Temperature.....1200°F.
Tensile Strength.....38,200 psi.
Elongation (2")..... 29.5%
Reduction in Area..... 86.1%

That's high quality metal! Metal destined for a high alloy casting which has to meet some pretty rigid specifications!

The story we want to tell here is about our Testing Facilities. We have right in our foundry every conceivable testing facility needed when checking static or centrifugal high alloy castings for industry. Where required, we make complete chemical, metallurgical, and mechanical checks and tests. And have both a 400,000 volt X-ray unit and gamma-ray unit, for checking the final casting for hidden flaws.

As we see it, the only way to assure customers of high quality castings is to have and use all necessary facilities for testing and checking the heat, pour and finished casting.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.
Detroit Office: 23906 Woodward Avenue • Pleasant Ridge, Mich.

Atlanta: J. M. TULL Metal & Supply Co. Chicago: F. O. NELSON 332 S. Michigan Avenue San Francisco: JOHN D. FENSTERMACHER 1241 Taylor Street
METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

NEW PRODUCTS and equipment

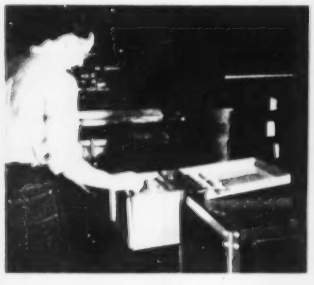
mold temperature is maintained. This permits production of gray iron, cylindrical castings in hot metal molds held at controlled temperature. Runner pot is mounted on hinged front door, eliminating the need for aligning the pot with the mold after each casting has been removed. Centrifugal Casting Machine Co., Dept. ST, Box 947, Tulsa, Okla.

USE REPLY CARD—CIRCLE No. 5

Production Parts Cleaner

. . . inspection without shutdown

Plunger-type parts cleaning can is attached to a bench convenient to machine operator, enabling him to clean parts as they come from machine. Micrometer checks for accuracy or any other type of in-



spection required can be completed without machine shutdown or interruption of process.

The terne plate, seam-welded rectangular container measures 10 x 7 x 8 inches to permit washing a variety of part sizes. A metal-perforated plunger dasher completely covers the opening. Dasher itself acts as a flame arrester, and in case of fire on its surface, the film of inflammable solvent vaporizes, mixes with air and burns off. Protectoseal Co., Dept. ST, 1920 S. Western Ave., Chicago 8, Ill.

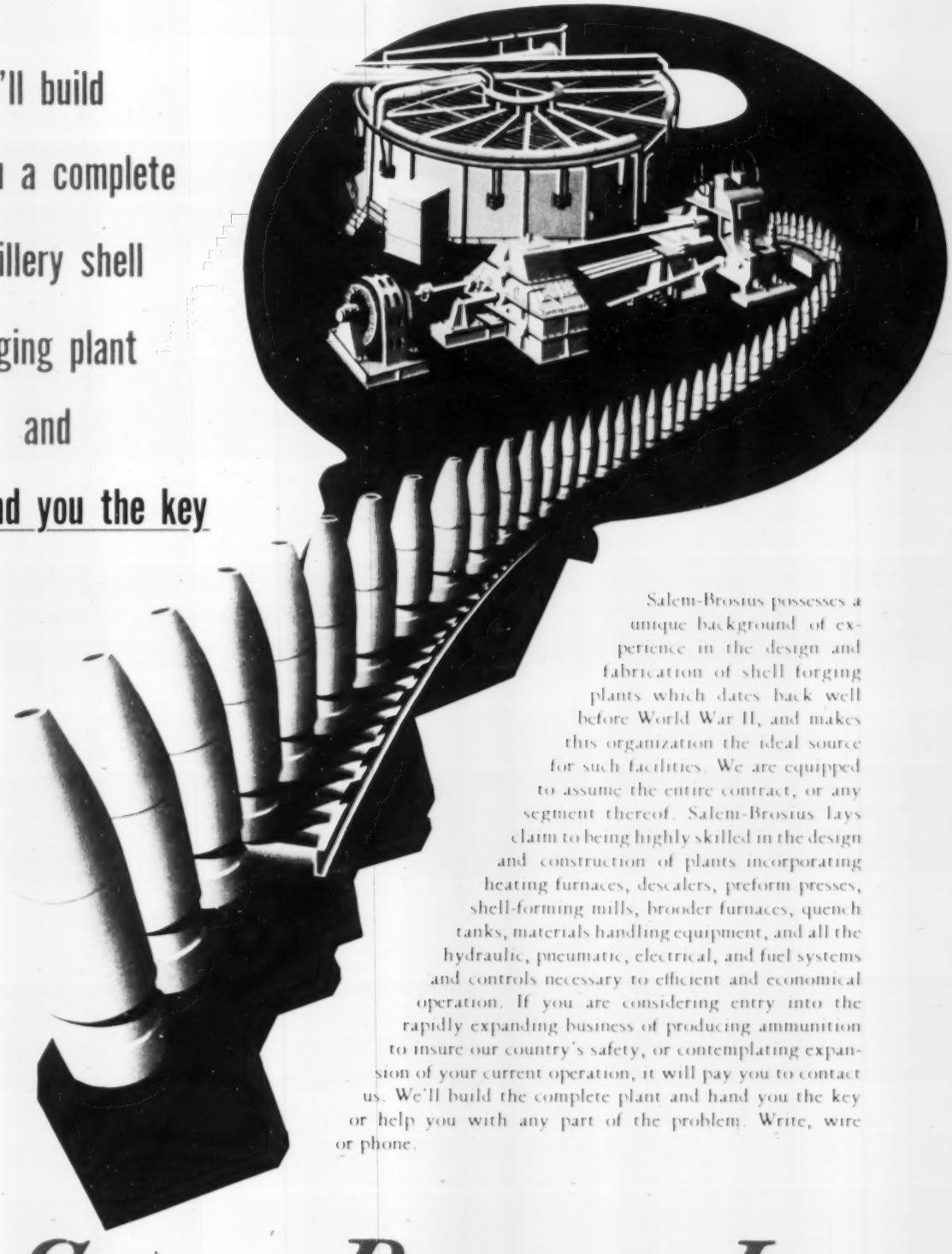
USE REPLY CARD—CIRCLE No. 6

Flux Compound

. . . for silver brazing

This flux compound is designed for universal application with silver solders in the brazing of ferrous and nonferrous metals. It may be used on all metals at all temperatures common to silver brazing. It covers the work and the brazing alloy, prevents oxida-

We'll build
you a complete
artillery shell
forging plant
and
hand you the key

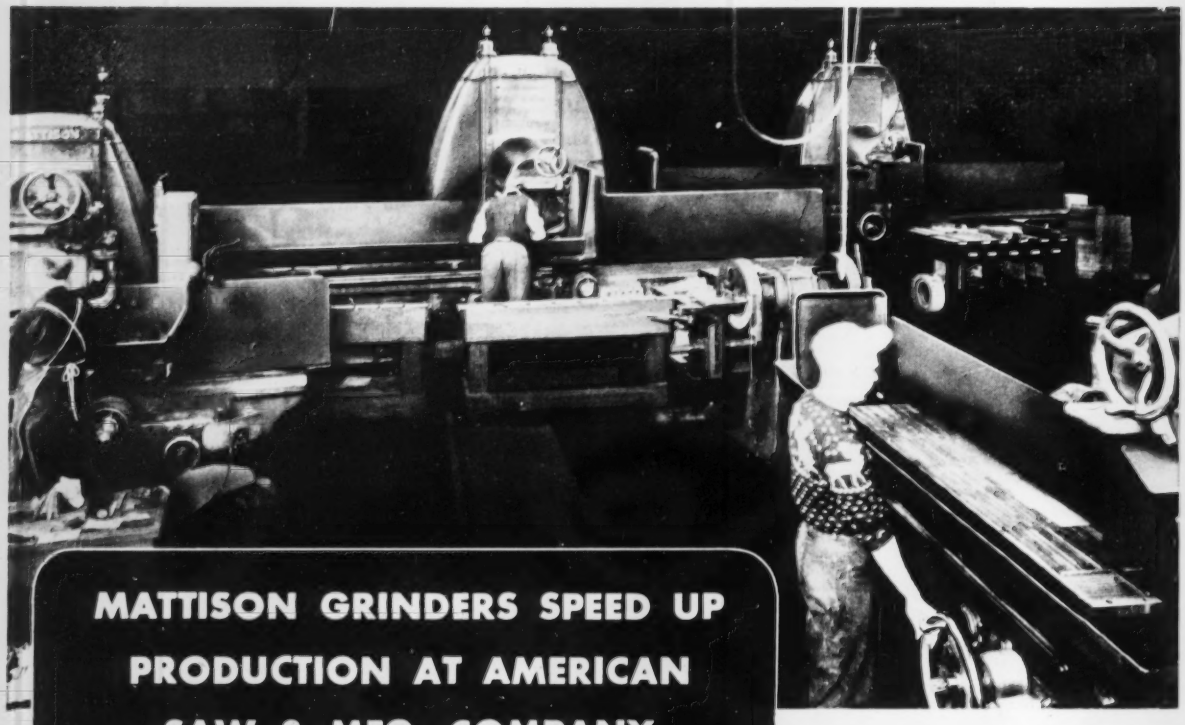


Salem-Brosius possesses a unique background of experience in the design and fabrication of shell forging plants which dates back well before World War II, and makes this organization the ideal source for such facilities. We are equipped to assume the entire contract, or any segment thereof. Salem-Brosius lays claim to being highly skilled in the design and construction of plants incorporating heating furnaces, descalers, preform presses, shell-forming mills, brooder furnaces, quench tanks, materials handling equipment, and all the hydraulic, pneumatic, electrical, and fuel systems and controls necessary to efficient and economical operation. If you are considering entry into the rapidly expanding business of producing ammunition to insure our country's safety, or contemplating expansion of your current operation, it will pay you to contact us. We'll build the complete plant and hand you the key or help you with any part of the problem. Write, wire or phone.

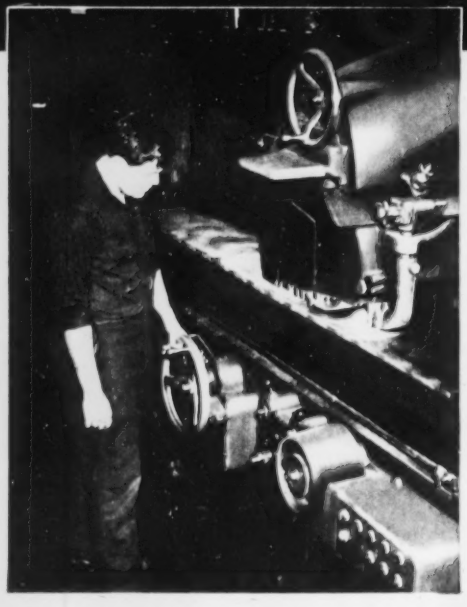
SALEM-BROSIUS, INC.

Sales and Executive Offices: 248 Fourth Avenue, Pittsburgh 22, Pa.

Brosius Division, Pittsburgh 15, Pa. • Salem Engineering Division, Salem, Ohio



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY



● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

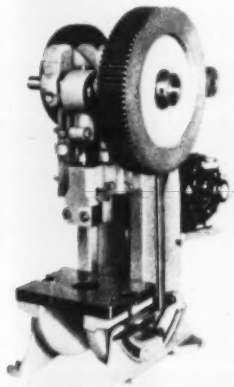
tion of surface during heating, brazing and cooling and cleans and floats off dirt or oxides. Flux also reduces surface tension of molten alloy. American Platinum Works, Dept. ST, Newark 5, N. J.

USE REPLY CARD—CIRCLE No. 7

Back-Geared Punch Press

. . . gains slow, powerful stroke

Punch press series is designed specially for drawing, forming and other operations that require slow, powerful strokes. Model is equipped with stub-tooth back gears, reducing speed range from 40 to 100



strokes per minute. Speed can be varied by changing size of motor drive-pulley.

Positive single-trip mechanism requires the ram to be individually triggered for each stroke. Ram stroke can be easily converted to continuous motion, however, by removal of one screw. Model can be hand-fed or fed automatically. Back-gearing is available on three presses: 4-ton standard, 4-ton deep throat and 7½-ton units. Benchmaster Mfg. Co., Dept. ST, 1835 W. Rosecrans Ave., Gardena, Calif.

USE REPLY CARD—CIRCLE No. 8

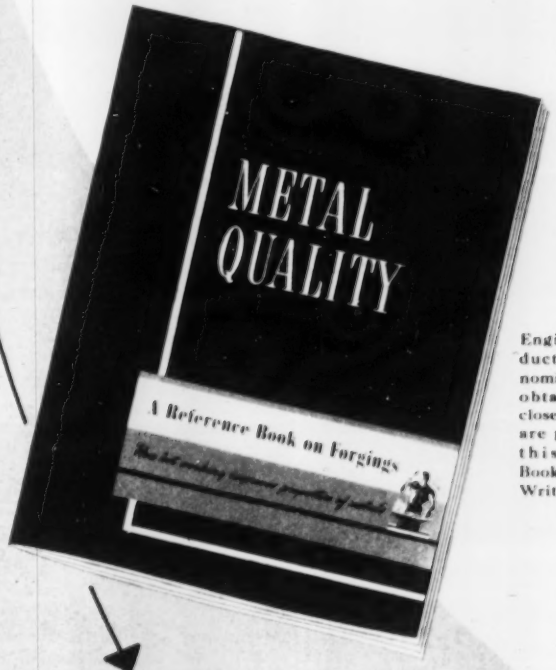
Pneumatic Cylinders

. . . have unitized rod bearing

An improved key type pneumatic cylinder features a unitized cartridge rod bearing that aids in servicing and reducing wear caused by misalignment. Cartridge unit includes long bronze rod-end bearing, rod packing and a self-centering packing at pivot point. Sizes

Forgings— closed die forgings— with their unmatched economic and mechanical advantages offer quick and complete solutions for Problem Parts problems confronting any member of a production team.

Consult a forging engineer about the closed die forging process for producing parts with the correct combination of mechanical properties required for your product.



Engineering, production and economic advantages obtainable with closed die forgings are presented in this Reference Book on Forgings. Write for a copy.

DROP FORGING ASSOCIATION
605 HANNA BLDG. • CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality — How Hot Working Improves Properties of Metal," 1949 Edition.

Name _____

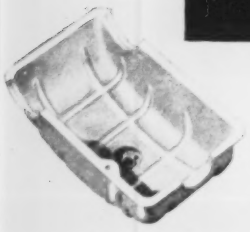
Position _____

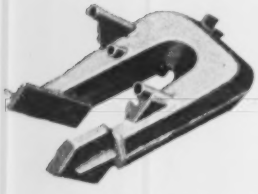
Company _____

Address _____

If GEOMETRIC can make 'em Better, Faster and Cheaper...

Why Not?





Why bother with the manufacture of medium and heavy stampings in your own plant, if you can prove to yourself that GEOMETRIC can make them just as well or better, faster and at lower cost?

Why bother with expensive equipment that takes years to amortize when presses of 40 to 450 ton capacity—plus our 37 years of stamping experience—are at your disposal?

Why not do what hundreds of leaders of American Industry have already done?—*Call in GEOMETRIC and find out how your product, or parts of it, can be made in our modern high-production stamping plant at surprisingly low cost.*

You have lots to gain and nothing to lose by checking our prices against your own costs. Just send us your blueprints. You'll be time and money ahead.

Write for free booklet —
"Geometric Craftsmanship"

GEOMETRIC STAMPING CO.

A Subsidiary of Barium Steel Corp.

1130 E. 200th Street Cleveland 17, Ohio

NEW PRODUCTS and equipment

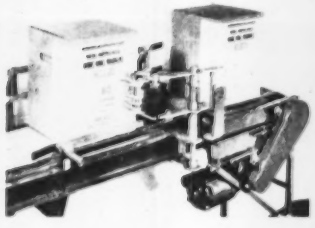
available are 1½ through 8-inch bores with a stroke of any length up to 18 feet. Carter Controls Inc., Dept. ST, 2800 Bernice Rd., Lansing, Ill.

USE REPLY CARD—CIRCLE No. 9

Improved Box Printer

. . . prints two sides and top

This marker prints one or two sides and top of containers on the conveyor after boxes leave the scales. Holders for printing can be changed quickly for sizes and styles. Molded National type and Logotypes completely eliminate



background printing that results with use of shallow type and dies.

Machine is equipped with reservoir-type ink fountains. Printing die cylinder automatically returns to starting position after each imprint. Size of printing roll left to right is 6 inches; top to bottom, 3½ inches. Printing unit can be mounted on any standard conveyor. Pannier Corp., Dept. ST, 207-209 Sandusky St., Pittsburgh 12, Pa.

USE REPLY CARD—CIRCLE No. 10

Expanded Impact Wrench Line

. . . drives all threaded fasteners

Two air-operated portable impact wrench sizes have capacity for driving ⅝ and ¾-inch diameter bolts. By use of various attachments, the wrenches can be used for running nuts, screws and almost all threaded fasteners in assembly operation. They also have proved satisfactory for tapping.

The M960, ⅝-inch size, weighs 9 pounds 10 ounces and is 9¾ inches long. Free run-down speed is about 5000 rpm. Larger model weighs 11 pounds, is 10⅝ inches long and has

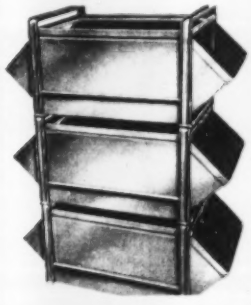
run-down speed of 4500 rpm. Both tools operate on 80 to 100 psi air pressure. Both models have built-in air-controlled regulators. Master Pneumatic Tool Co. Inc., Dept. ST, Orwell, O.

USE REPLY CARD—CIRCLE No. 11

Double-Ended Stack Bins

. . . continuous assembly work

These double-ended stackbins can serve operators on two facing assembly lines in continuous assembly operation. Materials or components are available instantly and are immediately accessible



from both positions. Reloading can be done from either end or by replacing with a full bin.

Also applicable for processing, racked bins can hold a complete assortment of components to serve two machine operators, saving floor space. Bins are made of heavy-gage steel with index-card holders on both ends. Stackbin Corp., Dept. ST, 1123 Main St., Pawtucket, R. I.

USE REPLY CARD—CIRCLE No. 12

Ratcheting Tool

. . . speeds internal wrenching

Fast internal wrenching of Allen head bolts and screws, and Phillips screws can be accomplished with hex and screwdriver adaptors snapped into this open-end ratchet wrench. Other adaptors drive standard sockets, turnbuckles, plugs and push-rod housings. Torque handles can be used with all heads, permitting instant torque reading and accurate control with-

TOWMOTORS IN ACTION IN U. S. INDUSTRY

Loading a 1,200 pound cargo of castings into an American Airlines freighter.

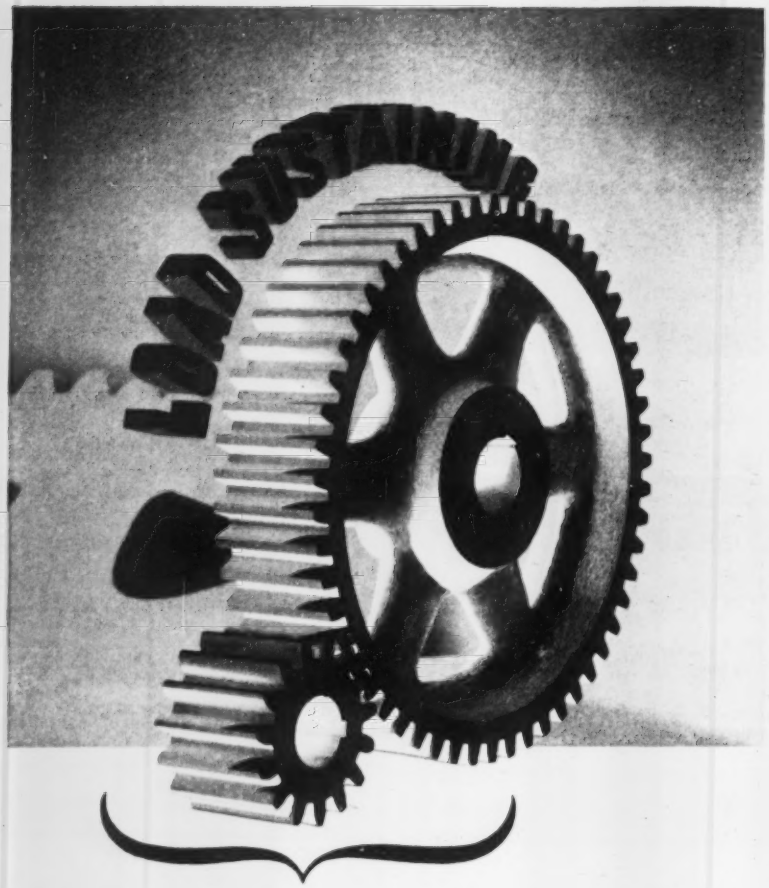
Right on schedule . . .

However tight the timing and whatever the type of load . . . Towmotor measures up to stiffest materials handling requirements, while bringing man-hour costs 'way down in the bargain. Write for your copy of "Man-Hour Thieves," Towmotor's new handbook for lowering plant operating costs, and name of your nearest Towmotor Representative. Towmotor Corporation, Div. 1603, 1226 E. 152nd St., Cleveland 10, Ohio.

Make the Towmotor Exhibit your first stop at the 5th National Materials Handling Exposition starting May 18, 1953

TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS
SINCE 1919
RECEIVING • PROCESSING • STORAGE • DISTRIBUTION



H & S gears are

EXTRA HEAVY FOR THE PITCH

● Built of the finest materials by skilled craftsmen, Horsburgh & Scott gears are accurate and husky. "Steel muscled" for hard work... rims, arms and hubs are extra heavy for the pitch. Outside diameter, faces and ends of hubs are smooth finished to the correct size. Pitch line is absolutely concentric with the bore. Teeth are accurately cut with the correct amount of backlash for smooth operation. Bores and keyseats are accurately and smoothly finished. They are built to stand the "gaff".

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for 488-Page Catalog 49

out interrupting wrenching operations.

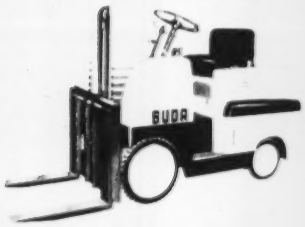
The open-end principle provides utility to supplant the need for a wide variety of single-purpose tools. Thin-walled sockets come in a range from $\frac{3}{8}$ to 4-inches in 1/16-inch increments. Tubing Appliance Co., Dept. ST, 10321 Anza Ave., Los Angeles 45, Calif.

USE REPLY CARD—CIRCLE No. 13

Gasoline, Diesel Trucks

. . . 30-minute clutch change

These gasoline and diesel-powered trucks are rated at 5000 pounds capacity at 24-inch load center from heel to forks. They are available in all standard lift heights from 72 to 120 inches. Wide open design makes all side panels, rear and top, easily remov-



able for quick accessibility to all parts. Trucks are provided with a 12-inch diameter industrial-type clutch that can be changed in about 30 minutes.

Trucks also feature a single-lever full range gear shift and center-point automotive-type steering. They have full front vision instrument panel, hydraulic brakes, rolled-steel mast and self-aligning lift cylinder. Buda Co., Dept. ST, Harvey, Ill.

USE REPLY CARD—CIRCLE No. 14

Hammer Mill

. . . screen replaced quickly

Screen replacements in a few seconds, during operations, are possible with the quick-screen-change hammer mill. Without stopping the mill or opening the cover, screen is easily withdrawn and replaced, sliding smoothly on nonbinding, leak-proof grooves. A range of sizes from 20 to 125

NEW

Cost cutting
Hard Surfacing
Electrodes

McKAY HARDALLOY

Low Hydrogen*- Hard Surfacing

ELECTRODES

Hard Surfacing Problems?

McKay Hardalloy Electrodes are the solution to your Hard Surfacing problems. Hard Surfacing Manuals, covering your specific application, are available upon request.

This complete new line of Hard Surfacing Electrodes was developed by The McKay Company, a leader in the stainless and alloy electrode field for many years. To cut costs and save money let us help you make the proper selection of the McKay Hardalloy Electrode for your specific application.

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KRANE KAR

SWING-BOOM MOBILE CRANE

CAN SWING IT!

SWINGS AND TRANSPORTS LOADS OF ANY SHAPE OR SIZE ANYWHERE IN YOUR PLANT

1½, 2½, 5 and 10 ton cap.

You don't have to face the load . . . swing the boom! It's live and handles up to 10 tons at either side. You can swing materials from a RR car right onto a waiting truck; reach into a boxcar and load it; stack piles two-deep and three-deep on both sides of aisle, increasing storage space; move loads into plant through low shop doors; work in narrow aisles and congested areas where other equipment cannot operate.

Only *KRANE KAR* can do such difficult materials-handling jobs *ECONOMICALLY* because 1—it transports full rated load; 2—tops and lowers boom by power; 3—lowers load by power; 4—has automatic crane braking at limit positions; 5—has good vision; 6—excellent traction and short turning radius; 7—gas-powered, it can work 24 hours a day.

Use *KRANE KAR* as a standby for bigger cranes and for emergency maintenance and repairs. *ASK FOR BULL. 89—STEEL, Metalworking and Metalproducing Industries.*

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

WASHERS and STAMPINGS

Geared to Industry's Production Demands Since 1887 . . .

Over a period of 65 years, producing standard and special washers of all types for all industries, we have made up more than 25,000 sets of dies . . . used in the production of washers which are stocked in thousands of different sizes. On special orders we will make up dies to your specifications.

Let us quote on your requirements for washers and stampings . . . covering fabrication in any material and any finish . . . machined, heat-treated or surface ground, as may be specified.

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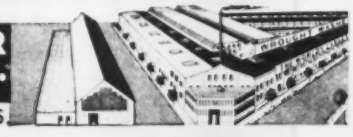


NEW PRODUCTS and equipment

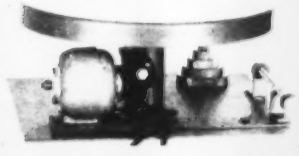
hp is available in belt driven and direct connected models. Schutte Pulverizer Co., Dept. ST, 27 Clyde Ave., Buffalo 15, N. Y.

USE REPLY CARD—CIRCLE No. 15

Lightweight Work Positioner

. . . bench and pedestal models

Electrically turned, varible speed work positioner is the smallest and lightest offered in the manufacturer's line. Positioner is available both as bench and pedestal model, with accessories to make it inclinable and operable intermittently. Without pedestal, the complete unit weighs 31 pounds, is 5½ inches high and covers an area 20 x 18 inches. Turntable is 15½ inches diameter.



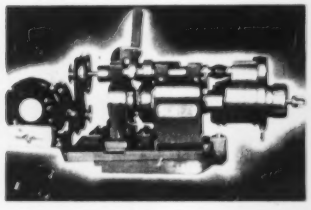
Positioner carries a 300-pound work load and moves it at speeds adjustable upward from ¼ rpm. Unit is used for welding, brazing, soldering, tinning, cutting and metallizing operations. All-State Welding Alloys Co. Inc., Dept. ST, 249 Ferris Ave., White Plains, N. Y.

USE REPLY CARD—CIRCLE No. 16

Grinding Attachment

. . . simple, speedy setups

Motor driven Circularity grinding attachment simultaneously revolves the work to be ground and moves it longitudinally. Standard spacer gears with a follower pin for each flute to be ground provide indexing for 2, 3, 4, 6, 8, or 12 flutes.



Simple, speedy setups on this attachment permit fast grinding of

SAVE splice #1

– to direct burial runs

SAVE splice #2

– to overhead runs

SAVE splice #3

– to duct runs

one length of **DURASHEATH** can do the whole job

LIGHTER. May be used in self-supporting aerial assemblies.

TOUGHER. Special neoprene jacket resists abrasion, mechanical injury, moisture, corrosion, sunlight, organic decay. No sheath electrolysis.

EASIER TO HANDLE. Light and flexible.

LESS COSTLY TO STOCK. One cable — versatile Durasheath — meets all electrical distribution needs.

*Trade Mark

Save splices and you save money! No more do you have to use one type of cable for underground distribution . . . another for overhead . . . and a third for conduits. You can run durable Durasheath* *in one continuous length for all these locations.*

Durasheath is normally stocked for applications up to 5,000 volts, and is available on order for higher voltages, for traffic control, airport† power and lighting, mines, industrial plants, railroads, street lighting and many other uses. See your Anaconda Representative. Ask for quotations. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

52370A

†When ordered to CAA Specification 1-824

the right cable for the job ANACONDA® wire and cable

AL Stainless Steel Castings meet any need for Cleanliness

Here's New Data on
ALLEGHENY METAL
in Various Industries

Available *now*—informative booklets on Allegheny Metal in the Chemical, Petroleum Refining, Brewing, Meat Packing, Dairy, Food Processing, Hospital and Laundry Industries—others in preparation. Write for this valuable data on the field in which you are interested.

ADDRESS DEPT. S-39

Note the clean, sound, fine-grained appearance of the Allegheny Metal sanitary fittings shown above, in the "as-cast" condition. They're typical of the wide variety of stainless steel castings we produce for the chemical processing, food, dairy, beverage, oil, paper and textile industries, etc.—wherever the purity and quality of products must be maintained, and where ease of sanitation and assurance of long, trouble-free service are prime considerations.

Allegheny Metal castings are produced by methods specially developed to protect uniform quality and guard against defects. You'll find them superior both from the standpoint of machinability and soundness. ● Let us quote on your stainless casting requirements—any shape and any size, from a few ounces to 5000 pounds. *Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*

You can make it **BETTER** with

Allegheny Metal

W&D 4440

AL TIME-TESTED STAINLESS STEEL

form and radial relief, tapered and straight cylindrical work. Cutting tool to be produced or reworked is held in collet or between dead centers and revolves on its own axial center. Detroit Reamer & Tool Co., Dept. ST, 2830 E. Seven Mile Rd., Detroit, Mich.

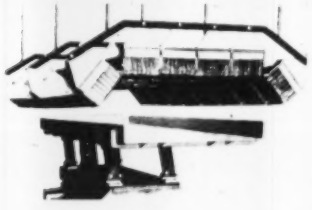
USE REPLY CARD—CIRCLE No. 17

Radiant Heating Panels

. . . use flat surface elements

Infra-red radiant heating panels employ flat surface electric heating elements to heat by direct radiation, eliminating use of reflectors. Panels throw a flat, uniform radiating pattern designed to lower production costs and time on baking, drying and heating processes.

Panels are made with two to eight elements backed by thermal



insulation, mounted to a steel box-type frame equipped with mounting flanges. By means of the mounting flanges, panels can be set up in various arrangements to form ovens, dryers, heaters, etc. They operate on any commercial alternating or direct current frequency. Syntron Co., Dept. ST, 370 Lexington Ave., Homer City, Pa.

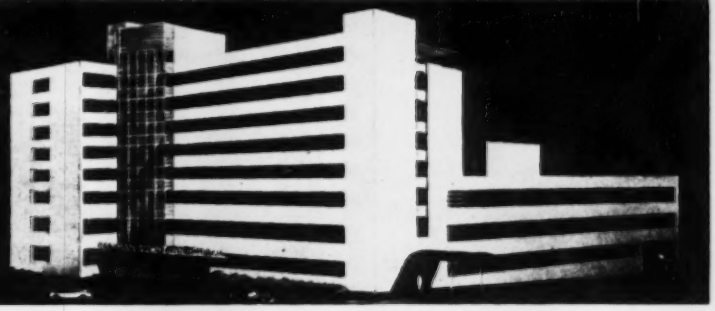
USE REPLY CARD—CIRCLE No. 18

Automatic Couplers

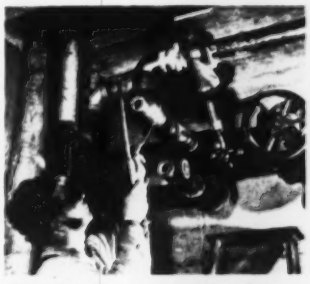
. . . replace towing eyes

Three types of automatic couplers are available for company's lift trucks and tractors. Installed as replacements for towing eyes, these couplers speed pickup and release of trailers. Each type is built with open jaw that automatically makes the connection when entered by trailer coupler. One type provides a hand-operated release lever, another employs a foot lever and the third permits operation of release mechanism either manually or by foot pressure. Tow-

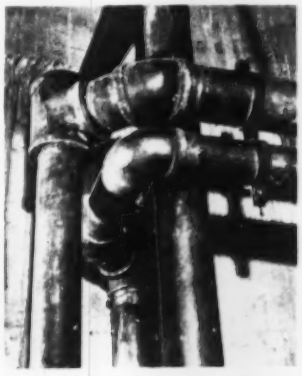
In this new BEEKMAN-DOWNTOWN HOSPITAL New York City...



4" and 5" water lines with Flagg face feed fittings all brazed with SIL-FOS.



SIL-FOS flows over entire joint area the instant its flow point is reached. Its extreme fluidity promotes capillary action, making it easy to braze joints in any position.



More 4" and 5" water lines with Flagg face feed 45 s, elbows and tees.

All Water Piping is brazed with SIL-FOS

Everything in this hospital now being built in downtown New York City is up-to-the-minute. The water piping is no exception. Type B brass pipe and Flagg face feed fittings are used in both hot and cold water lines—all joined the modern way with SIL-FOS, the low-temperature silver brazing alloy for non-ferrous metals. Because it eliminates threads, brazing permits the use of this pipe, which has 1/3 the wall thickness of standard pipe. This means a tremendous saving in metal and weight.

Pipe sizes in these lines range from 1/2" to 5". All told there are some 6000 fittings, about half of which are tees. That makes about 15,000 SIL-FOS brazed joints—leak-tight joints that can't work loose and will never need maintenance. That's mighty important in a hospital—or anywhere else for that matter.

IF YOU'RE INTERESTED

in joining fittings to pipe or tubing, write for a copy of BULLETIN 17.

It gives complete instructions on how to braze both ferrous and non-ferrous piping with EASY-FLO and SIL-FOS.

—AND IF YOU WANT

full details about EASY-FLO and SIL-FOS brazing, plus helpful dope on joint design and fast production methods, write today for a copy of BULLETIN 20.

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

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STEEL - *Easy and Fast with* **UNIT**

Lifting, carrying and spotting steel girders into the exact position requires STABILITY — FLEXIBILITY and PERFECT CONTROL. A UNIT Crane gives you all these features . . . and more. Extra Long Crawlers — Multiple Hinged Shoes — Wide Axles and Hook Rollers provide perfect stability. Smooth accurate control of boom and hoist lines permits precision handling. UNIT'S FULL VISION CAB gives the operator excellent visibility . . . makes steel setting jobs easier and faster. UNIT equipment can be quickly and easily converted to handle a wide variety of work. To speed up your steel construction, investigate UNIT. Write for literature.

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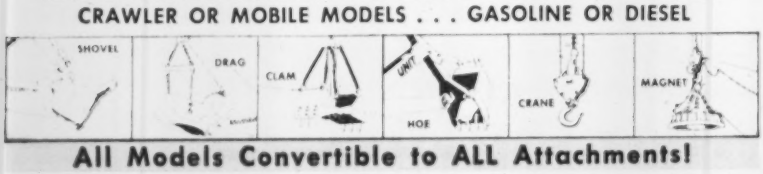
½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

NEW PRODUCTS and equipment

motor Corp., Dept. ST, 1226 E. 152nd St., Cleveland 10, O.

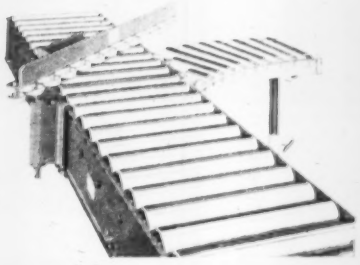
USE REPLY CARD—CIRCLE No. 19

Live Roller Switching

. . . remote control at any point

Simplified switching method by means of diverting rail from live roller to spur can be used at any point on a live roller conveyor. Clamp attachments simplify moving the units to any desired position.

Wheel diverting rails can be remotely controlled for diversion at



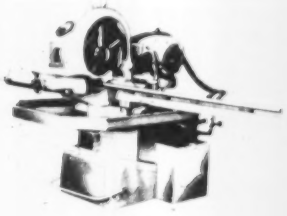
any one of the series of spurs, making complicated switching equipment unnecessary. Metzgar Co., Dept. ST, 409 Douglas St. NW, Grand Rapids, Mich.

USE REPLY CARD—CIRCLE No. 20

Cutoff Machine Line

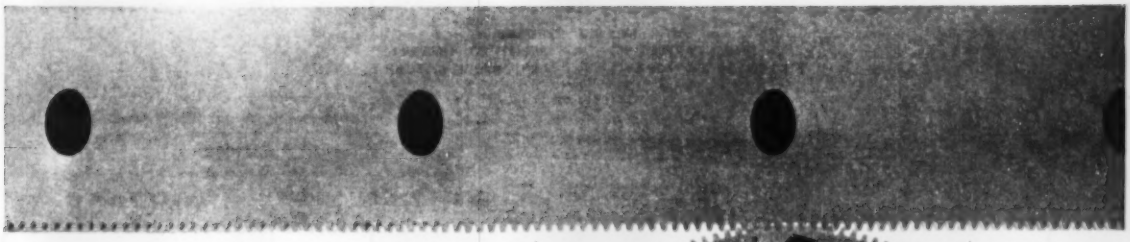
. . . no heat or hardening

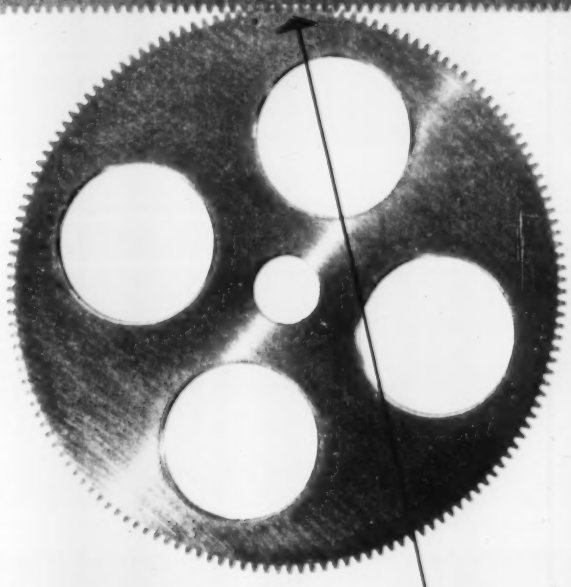
Line of cutoff machines is designed to increase abrasive wheel life through redesigned application of wet-cutting, bonded abrasive



wheel technique. Accuracy of cut is reported at plus or minus 0.005-inch. Smoothness of cut is equal to ground surface.

Burr and fraze are said to be eliminated, especially when cutting thin-walled material. No lathe refacing is necessary. To cut with-





Why you can *reduce rejection losses* with a Kodak Conju-Gage Gear Checker

Why the composite check

In practice, the final test of gear quality is how the gear works in use. The composite check recommended in American Standard B6.11-1951 shows this conclusively by measuring displacement of the gear when run against a master of known accuracy. And it does it in one quick operation that checks combinations of as many as six types of errors.

Why the Conju-Gage Gear Checker

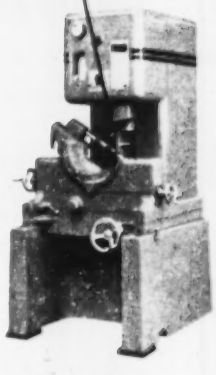
Since displacement represents the sum of both gear error and error in the master, the accuracy of the master used determines the precision of the composite check. The Kodak Conju-Gage Gear Checker uses a master of exceptional accuracy, the Conju-Gage Worm Section. Produced by thread grinding, its accuracy is not limited by the same manufacturing processes which limit accuracy in the gear itself.

To settle for masters of lesser accuracy is to rob yourself of "tenths"—to chance that tolerable error in a gear may coincide with error in the master to cause a needless rejection. Or that intolerable error in a gear may be cancelled by error in the master to pass a gear that will fail in use.

To reject every wrong gear is to guard the quality of your product. To pass every right gear is to reduce such rejection losses to a minimum.

To find out more about how a Kodak Conju-Gage Gear Checker can lower costs while maintaining required precision, send for your copy of the booklet, "Kodak Conju-Gage Gear Testing Principle." Write to

Industrial Optical Division
EASTMAN KODAK COMPANY, Rochester 4, N. Y.



The Kodak Conju-Gage Gear Checker automatically records the composite effects of runout, base pitch error, tooth thickness variations, profile error, lead error, and lateral runout. Illustrated is the Kodak Conju-Gage Gear Checker, Model 8U, for gears up to 8¼" pitch diameter. Smaller models are also available.

CONJU-GAGE INSTRUMENTATION

... a new way to check gear precision in action

To inspect all kinds of complex parts on a bright screen, Kodak also makes two highly versatile contour projectors.

Kodak
TRADE-MARK

A Holcroft furnace like the one illustrated bears out the fundamental law of economics "the best costs just a little more . . ."

For example, in this installation, trays act as an insulating barrier so that the upper and the lower ends of the parts are heat treated to different temperatures. Result: one less furnace, one less operation.

The little extra you might invest in a Holcroft furnace pays big dividends in saving time, saving space, uniform work, fewer rejects, and a lower cost-per-piece. And in the final analysis, it means an installation that costs less than you might anticipate.

All of these benefits are available to you at Holcroft. For more information, write today.

Holcroft and Company, 6545 Epworth Blvd., Detroit 10, Michigan.

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R. E. McArdle
5724 Navigation Blvd.

CANADA
Walker Metal Products, Ltd.
Windsor, Ontario

EUROPE
S. O. F. I. M.
Paris 8, France

out creating heat or hardening, a segment of the cutting wheel is encased in a removable housing that contains integrally cast radial vanes. Coolant is supplied by pump to each half of the housing guard. Rotation of abrasive wheel builds up water pressure between faces of wheel and guard. Ballinger Division, Douglas Export-Import Corp., Dept. ST, 17 Battery Pl., New York 4, N. Y.

USE REPLY CARD—CIRCLE No. 21

All-Shade Welder's Helmet

. . . no lens change necessary

Helmet attachment, designed to fit all standard welders' helmets, gives complete protection in shades from 6 to 12. It eliminates the need for changing lenses whenever

the operator changes from one type of work to another.

The attachment is particularly adaptable for starting and welding on close work where it is necessary to see the work without risking burns or other damage with the hoods up. After the arc is struck, a quick turn moves the attachment to higher intensity. The Vari-Shade unit is furnished with a 1000-hour cover lens. Polacoat Inc., Dept. ST, Blue Ash, O.

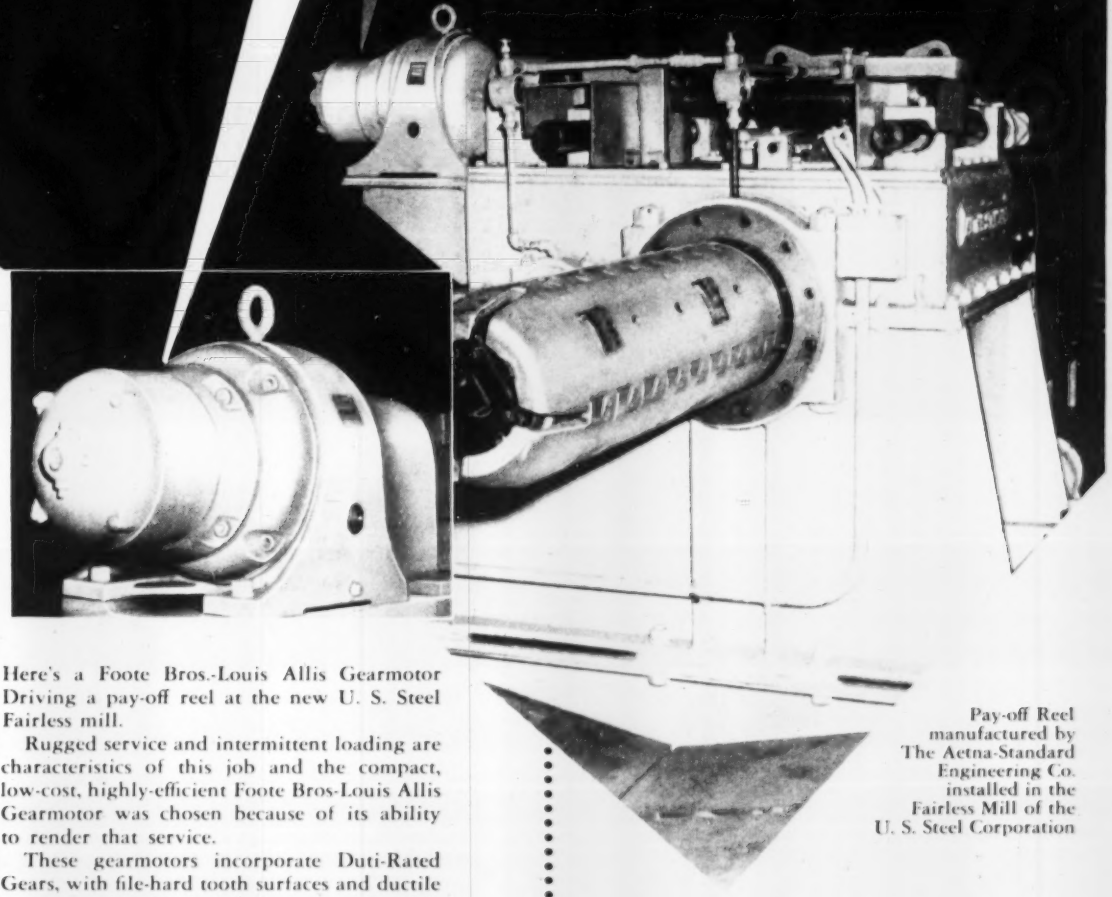
USE REPLY CARD—CIRCLE No. 22

Groove Gage

. . . for small air devices

Measurement of small internal groove diameters is made quickly and accurately with the line of Series P gages. Standard models are small enough to enter a 0.310-inch bore and measure groove diameters for O ring AN6227-6 and snap ring groove NAS-50-31. It can be used to measure thread reliefs, by-pass reliefs in hydraulic mechanisms, small bores, etc.

when a job takes guts here's the gearmotor that has it . . . .



Here's a Foote Bros.-Louis Allis Gearmotor Driving a pay-off reel at the new U. S. Steel Fairless mill.

Rugged service and intermittent loading are characteristics of this job and the compact, low-cost, highly-efficient Foote Bros-Louis Allis Gearmotor was chosen because of its ability to render that service.

These gearmotors incorporate Duti-Rated Gears, with file-hard tooth surfaces and ductile cores, assuring maximum strength with minimum size and weight. Available in single, double and triple reductions, to provide output speeds of 780 down to 7.5 r.p.m.

FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Boulevard • Chicago 9, Illinois

Hygrade Drives

Line-O-Power Drives

Maxi-Power Drives

Pay-off Reel manufactured by The Aetna-Standard Engineering Co. installed in the Fairless Mill of the U. S. Steel Corporation

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 4545 S. Western Boulevard, Chicago 9, Illinois
Please send me Bulletin GMA containing full information on Foote Bros.-Louis Allis Gearmotors.

Name .....

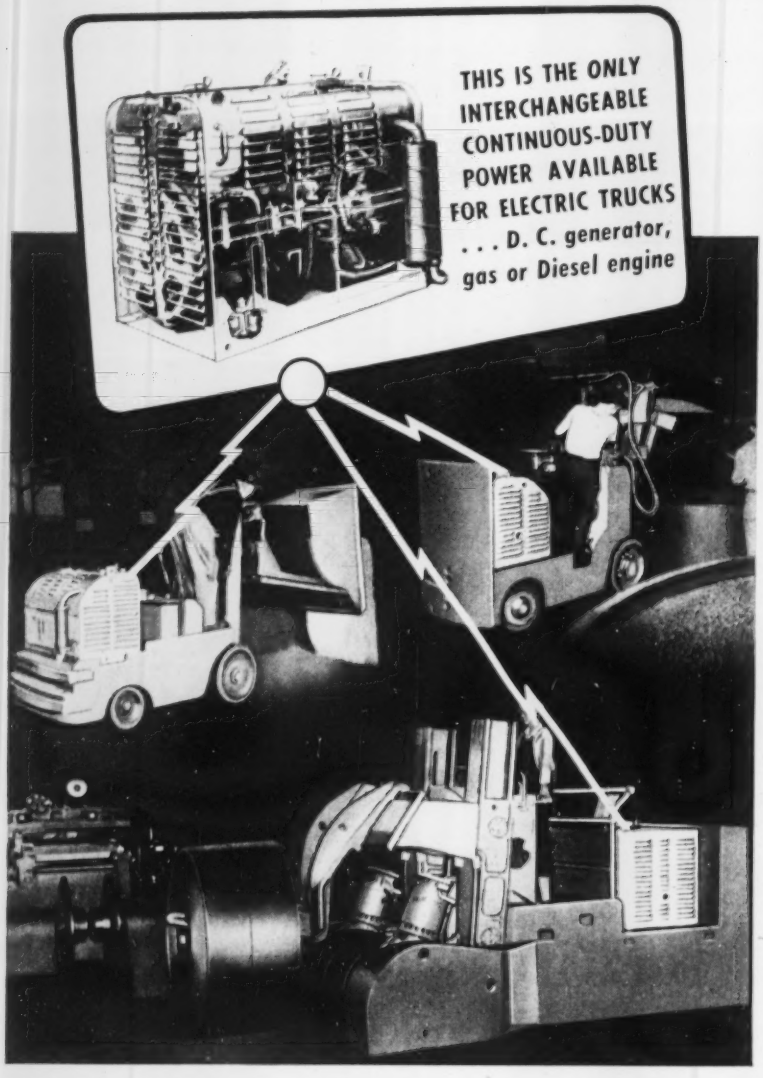
Company .....

Address .....

Position .....

City ..... Zone ..... State .....

Ready-Power Adds 'GUTS' to Electric Truck Performance



Only Ready-Power Drive gives electric trucks the stamina that means *full power all the time!* With no limit to hours of service, Ready-Power-equipped trucks handle the toughest jobs at lowest costs per ton-mile. Gas-electric and Diesel-electric models are available for ALL sizes of electric trucks.

CONTINUOUS-DUTY POWER UNITS

Remember . . . Your Truck Is No Better Than Its Power!

The READY-POWER Co.

4824 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units, Gas and Diesel-Electric Power Units for Industrial Trucks

NEW PRODUCTS and equipment

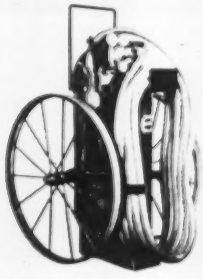
Rimat Tool Co., Dept. ST, 21 W. Dayton St., Pasadena 2, Calif.

USE REPLY CARD—CIRCLE No. 23

Dry Chemical Fire Fighter

. . . one man fights fires

One-man dry chemical wheeled engine has capacity of 150 pounds for extinguishing class B and C fires. The unit discharges quick-smothering Alfco dry chemical. Dispersion density of the sustained pressurized discharge cools and in-



sulates the operator from heat. Discharge is 20 to 25 feet.

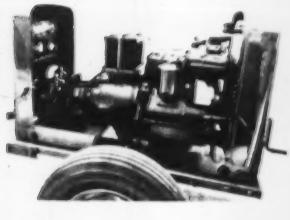
Expellent is dry nitrogen, with 200 psi sustained operating pressure during entire discharge period. Contents can be completely discharged in about 45 seconds. Nozzle lever has spring-loaded mechanism that permits opening or closing at operator's option. American-La-France-Foamite Corp., Dept. ST, Elmira, N. Y.

USE REPLY CARD—CIRCLE No. 24

Portable Power Plant

. . . for indoor or outdoor use

Pushbutton-controlled portable power plant provides a movable source of power for indoor or out-



door use. The plant is completely controlled by electric brakes and clutches, and its pushbutton system assures operating ease. The plant can operate pumps, com-

pressors, generators, hand tools and other machinery transported from job to job.

The self-contained unit has 1500-w output and can operate on either 110 v or an independent 6 v system. Warner Electric Brake & Clutch Co., Dept. ST, Beloit, Wis.

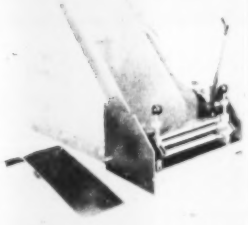
USE REPLY CARD—CIRCLE No. 25

Pinch Roll Cradle Attachment

. . . feeds troublesome material

Pinch-roll attachment for the manufacturer's automatic coil cradles is designed for positive feeding of troublesome stocks. It handles material between 0.010 and 0.150-inch thick.

The attachment provides two powered pinch rolls and four powered cradle rolls, making a feed not dependent on weight of the coil



body. Powered cradle rolls help accelerate the coil, minimizing stock marking done by pinch rolls. Unit is particularly effective with light and tempered stock, and with heavier gages where the coil is set and there is a tendency to rewind. Rowe Machinery & Mfg. Co., Dept. ST, 1506 N. Industrial Blvd., Dallas, Tex.

USE REPLY CARD—CIRCLE No. 26

Tilting Fork Stacker Line

. . . lightweight, compact design

Telescopic tilting fork stacker line is increased by addition of trucks in four base capacities: 1500, 2000, 2500 and 3000 pounds — all rated at 24-inch center line of load. Two standard Powrworker models are offered in each capacity. One has 83-inch overall height, with 64-inch free lift and maximum 130 inches lift. The other has 68-inch overall height, 49-inch free lift and 100-inch maximum lift.

Trucks are lightweight, but compact in overall length and width to provide maximum utility for oper-

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☐ Are the cores tough, ductile, and shock-resistant?
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Here is a new treatment for solving your heat transfer problems that is as revolutionary as a new wonder drug. It stops coil-itis* cold . . . It eliminates the many troubles that have plagued industrial heating and cooling practices due to the use of old-fashioned, outmoded pipe coils. This revolutionary new unit, called a Platecoil, heats or cools 50% faster and takes 50% less space in the tank. It simplifies maintenance and saves hours of downtime.

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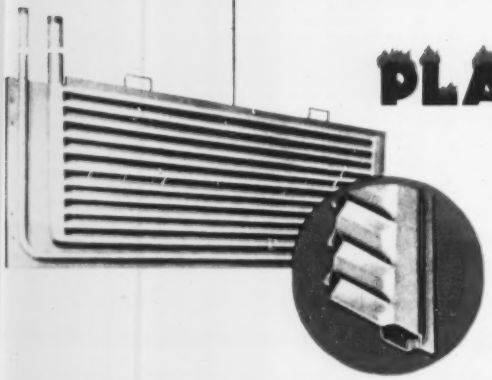
PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS COOL QUENCH OIL TANK FOR ⅓ THE COST

At the K-D Manufacturing Company, Platecoils are proving more efficient, yet cost only 1/3 as much to install. Ask about other case histories.



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REPLACES PIPE COILS

*Coil-itis — Diagnosed as tank heating and cooling problems. **Platecoils** — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, KOLD-HOLD MANUFACTURING CO., LANSING 4, MICHIGAN

NEW PRODUCTS and equipment

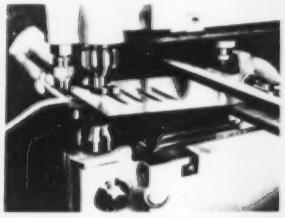
ating in minimum aisles and over low capacity floors. Lifting speeds vary from 21 to 14 fpm, depending on load. Clark Equipment Co., Dept. ST, Buchanan, Mich.

USE REPLY CARD—CIRCLE No. 27

Special Sheet, Plate Tools

. . . cut and form louvers

Special sheet and plate-working tool attachments cut louvers in steel and nonferrous metals, cutting and forming in a single operation. Although radius and opening remain constant, the louver can be cut to any length. Attachment has a swing-type female die in the



lower section that can be moved to right or left for final end forming.

Tools suggest savings in applications where louvers must be cut to various lengths in small production runs. They eliminate need for dies or presses and are said to produce a complete job that requires no further finishing. American Pullmax Co, Inc., Dept. ST, 2455 N. Sheffield Ave., Chicago 14, Ill.

USE REPLY CARD—CIRCLE No. 28

Jet Superheating Torch

. . . made in two models

Two jet superheating torches for preheating, bending, descaling, etc., are fabricated of seamless steel tubing. B-1 is a light weight model and operates from any standard propane tank at tank pressure.

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

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69. Flexible Couplings

American Flexible Coupling Co. The seven major engineering advantages of the Fully Crowned Teeth employed in Ameri-gear flexible couplings are subject of 4-page illustrated bulletin 1052. Applications of couplings for solving various power transmission problems are cited.

70. Liquid Flame Heating

Ajax Electric Co. The Ajax salt bath furnace used for the selective heat treating of the rims or edges of circular objects, such as teeth on gears or sprockets, is briefly described and illustrated in single sheet mailing piece.

71. V Belt Drives & Sheaves

Pyott Foundry & Machine Co. Containing revised data, 56-page catalog and reference book V-1000 provides all the information necessary for specifying Pyott drives, Vee-Tex belts and sheaves. Drives from 1 to 1000 hp are specified, and drive and belt center ratios, sheave dimensions and belt speeds are completely tabulated.

72. Filing Machine

All American Tool & Mfg. Co. "It files, it saws, it hones" the All American precision filing machine, that is. Features of this machine, whose each stroke is true, with no tapering or rounding off of edges of work, are outlined in 4-page folder.

73. All About Ansul

Ansul Chemical Co. To familiarize you with this company, its products, personnel and history, plus obtaining pertinent facts about the city in which it is located, send for this interesting 12-page illustrated brochure "Welcome to Ansul."

74. Slag Disposal Unit

American Conveyor Co. Foundry slag, granulated by dropping into a quenching tank supplied with circulating water, is conveyed and discharged into a cart or barrow by the American portable slag disposal unit, described in form SD-101. Also described and illustrated are a 8½-cu ft capacity Speed-Barrow and the Con-Way-It S-20 portable conveyor.

75. Centrifugal Compressors

American Blower Corp. 12-page illustrated bulletin 109 covers functions, applications, ratings, features of design, arrangements and methods of control for line of single stage centrifugal compressors. Units are rated from 30 to 600 hp and have pressures from 1½ to 3¾ lb.

76. Spring Steel

Lapham Hickey Co. 8-page illustrated "Stock List" covers complete line of tempered and annealed spring steel. Prices, weights and sizes are given on blue tempered and polished, black oil tempered, feeler gage, cold-rolled annealed and hot-rolled floor annealed spring steel stock.

77. Dust Collectors

Aget-Detroit Co. How the dust from 27 grinding wheels in the tool room of a leading manufacturer of compressors is being controlled by Stanlard Duskop dust collector is detailed in illustrated bulletin 637. How time and money was saved is explained.

78. Hydraulic Testing Machines

Riehle Testing Machines Div., American Machine & Metals, Inc. Line of hydraulic universal testing machines is described and illustrated in 32-page catalog RU-7-52. Machines made in eight capacities from 10,000 to 100,000 lb have their construction features, operation, safety features and specifications covered in detail.

3-2-53

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79. America's Muscles

National Machine Tool Builders Association "Machine Tools—America's Muscles" is title of 20-page illustrated booklet which associates machine tools with the capacity to produce. It outlines the arts of turning, drilling and boring, milling, planing and shaping, grinding and forging, shearing and pressing.

80. Volt-Ammeter

Associated Research, Inc. Specifications and performance data on model 601 alternating current volt-ammeter are contained in 1-page bulletin 6AA. Instrument has dual multi-range meters for simultaneous potential and current measurements from 0.2 to 500 amp at 30 to 600 v in frequency range of 25 to 133 cycles.

81. Telephone Type Relays

Automatic Electric Co.—Details of a complete line of telephone type relays, including hermetically sealed in metal and glass containers, subminiature, plug-in and other types are contained in 12-page illustrated bulletin 1702-A. Designed for industrial use, relays are available to meet practically all needs.

82. Fabricating Welded Tubing

Armco Steel Corp.—Here is a valuable 24-page well-illustrated booklet which tells "How To Fabricate Armco Welded Steel Tubing". Liberal use is made of cross-sectional drawings and sketches. Cutting, deburring, bending, swaging, forming, punching and notching, drilling, joining, cleaning and finishing are detailed.

83. Precision Gages

Size Control Co.—Reversible go and no-go plug gages, reversible thread gages, centerless lapping machines and all sizes of AGD gages are described in illustrated 24-page catalog 53. Also covered are company's facilities for special gage development and production, metallurgical research and developing instruments for precision measuring and checking.

84. Casting of Gray Iron

American Car & Foundry Co.—"Artistry in Metal" relates the story of gray iron casting as employed at this company's plants. Presented in pictorial and captioned form, this 40-page booklet explains techniques employed, outlines casting procedures and shows typical products which include melting pots, ingot molds, utility castings, chilled wheels and rollers.

85. Metalworking Machinery

Kling Bros. Engineering Works—In 42-page spiral-bound catalog you can get complete information on Kling combination shear, punch and copers; double angle shears; combined punch and beam bender; bulldozers; beam benders and straighteners; punches; bar shear; rotary shears; and friction saws. Construction features and specs are presented on each.

86. Rotating Parts Tester

Warren Brothers Roads Co., Mfg. Div.—Spintesting, the rotation of a part at high speed to check mechanical perfection and vibration characteristics, is described, and equipment for it illustrated in 4-page bulletin. Specs are given on three models, and turbine rotor testing is outlined.

EDITORIAL REPRINTS:

87. Plating on Aluminum

Zincate immersion pretreatment is the most practical and economical method for plating on aluminum. How to smooth out production line difficulties and improve corrosion resistance of the plated products is pointed out in STEEL reprint, "Plating on Aluminum."

88. Dam Gate Fabrication

Manual hidden-arc welding methods used by Phillips & Davies Mfg. Co. to fabricate dam gates and accessory water control equipment are four to five times as fast as hand arc methods. Welds with deep penetration and little stress are achieved. J. Quigley of Lincoln Electric Co. describes this hidden arc method in STEEL reprint "Manual Hidden Arc Lowers Fabricating time."

89. Plastic-Bodied Cars

For a brief description of the method used by Glasspar Co. and U. S. Rubber Co.'s Naugatuck Chemical Div. in making plastic sports car bodies, get STEEL reprint entitled "Plastic-Bodied Cars Hit the Roads."

90. Grinding Wheel Life

Chipbreaker grinding in carbide cutter tips is an operation where wheel life is important. Width of wheel, coolant and feeds all have an effect on this life. In STEEL reprint, "Right Wheel Cuts Diamond Consumption," J. W. Ripple of Carborundum Co. discusses effect of these and other factors on wheel life.

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NEW PRODUCTS and equipment

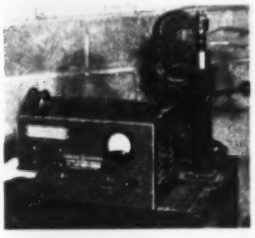
B-2 is the heavy duty model and operates on liquid gas by inverting tank or using tank equipped with dip tube. Weldit Inc., Dept. ST, 990 Oakman Blvd., Detroit 6, Mich.

USE REPLY CARD—CIRCLE No. 29

Portable Resistance Indicator

. . . no guesswork in welding

This portable surface resistance indicator provides rapid, accurate measurement of resistance between pieces of metal to be welded. Taking the guesswork out of welding, the unit checks enough pieces



in 15 minutes to last through a 12-hour welding period on one reported production installation.

In operation, pieces of metal are placed between the sample holder jaws, desired pressure is applied and surface resistance indicated on a microhmmeter. The entire operation is completed in a few seconds. General Electric Co., Dept. ST, Schenectady 5, N. Y.

USE REPLY CARD—CIRCLE No. 30

Diaphragm Chuck

. . . has strong grip

An air operated diaphragm chuck employs a compact booster mechanism within the self-contained air cylinder. The stepped up power permits use of a stiffer, heavier diaphragm that assures higher torque factor. Positive stops are provided in the design. Sheffer Collet Co., Dept. ST, Traverse City, Mich.

USE REPLY CARD—CIRCLE No. 31

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

new Willson

BRONZE

safety spectacles

combining ***eye protection*** *with the* ***color styling*** *workers want today!*

Style WB—choice of new spatula temples as shown, or half plastic, half cable type temples. Style WBS—has matching bronze sideshields.

Not one, but *two* new features make these sturdy safety spectacles an exceptional value. Their distinctive bronze color gives them a pleasing appearance. And the new non-flammable frame is toughest plastic made for spectacles—won't chip, crack or craze—and has greatest shock resistance.

Willson Bronze styles feature the "keyhole" bridge and popular Hi-Line* temple. Brand-new wire core spatula temples add an extra comfort feature you'll welcome. They're easy to adjust for a perfect fit!

These attractive spectacles are available with Super-Tough* heat treated glass lenses or Willson Plas-Tough plastic lenses. A full range of eye and bridge sizes make these spectacles ideal for use with prescription lenses. See your nearest Willson distributor for these new Willson Bronze styles—or write for descriptive bulletin.

For those who prefer flesh-colored plastic spectacles, with the same safety and comfort features and choice of temples, see Style WK and Style WKS.

More than 300 Safety Products Carry This Famous Trademark

WILLSON

Established 1870

WILLSON PRODUCTS, INC., 233 Washington St., Reading, Pennsylvania

Just as a goalie needs protection...

IRON and STEEL
***Need* PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant
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IN THE HEART OF THE STEEL INDUSTRY

HOT DIP GALVANIZING

galvanizing . . . pickling . . . painting . . . oiling

The Market Outlook

STEEL consumers are watching pricing developments in iron and steel scrap closely for a possible clew to the trend in the finished steel markets over coming months. The direction scrap prices move, now that they have been decontrolled, is seen as probably pointing the way for steel, since scrap, historically, has been an excellent barometer. In the past, scrap often signalled a change in general business long before it became noticeable in other markets, and return to normal trading procedures is expected to restore to this market its former sensitivity to impending developments in the economy.

SCRAP—Decontrol of scrap prices has not yet resulted in any particular change in the market. Buyers and sellers are awaiting concrete developments. Both sides of the market want to make sure they know which way the "cat is going to jump." As a result, former ceiling prices are holding on steelmaking and railroad grades with blast furnace and cast iron grades continuing to display weakness.

NONFERROUS PRICES—Steel men also are closely observing developments in the nonferrous metal markets. Last week copper and related prices developed a bullish flurry. Scrap copper control was lifted more than two weeks ago and prices advanced sharply. However, movement to consumers was sluggish with primary copper prices still controlled. Last week, however, the government removed controls on primary copper prices and the market immediately went up three to four cents per pound. Whether still further advances impend is uncertain with the market in an unsettled position. In addition to copper and copper products the government late last week also decontrolled aluminum and aluminum product prices.

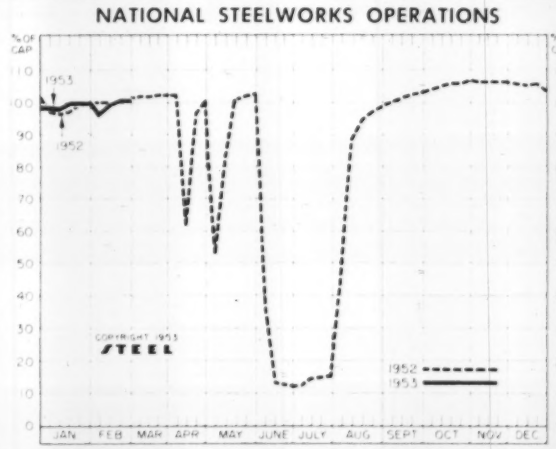
STEEL PRICES—There is nothing in the markets as yet to indicate how steel prices will go when they are decontrolled. Some adjustments on products considered out of line are anticipated, but no across-the-board revision, either up or down, seems likely despite bright demand propects over coming months. Increasing competition for orders is indicated as supply comes into closer balance with demand and this is expected to keep prices under control. In this connection, recent reduction of $23 per ton on standard structural shapes by an eastern mill quoting premium prices is considered significant. Currently, prices are unchanged with STEEL's weighted index on finished steel holding at 181.31. Some items made of steel, such as screw machine products and fasteners, were relieved of price control last week. Also, certain ferroalloys were granted a pass-through increase by OPS.

DEMAND—All of the major finished steel products are under strong demand pressure. Relatively few items are likely to be available to consumers without tickets before end of first quarter. While the Controlled Materials Plan has been open-ended, permitting producers to dispose of any excess tonnage over allotments as they please, indications are such excess will be mighty small in such major products as heavy plates, large-size bars, structurals, hot and cold-rolled sheets.

ALLOCATIONS—Expectations are the government allocation system for steel and other critical materials will be abandoned June 30 except that requirements for military, atomic energy and defense projects will be assured priority. Control over distribution of steel, copper, aluminum and other materials for civilian-type industry appears doomed. It does not necessarily follow, however, that such materials will be easier to get since supply conditions will continue to hinge upon the demand factor with the consumer fending for himself without government dictation as to who gets what, and how much.

PRODUCTION—With the mills under demand pressure from all consuming directions, steelmaking operations continue pressed at capacity pace. National ingot rate last week held unchanged at 100.5 per cent.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 28	Change	Same Week 1952	Same Week 1951
Pittsburgh	106	5*	102.5	101
Chicago	104.5†	1*	104	103.5
Mid-Atlantic	95†	0	98	99.5
Youngstown	106	0	105	101
Wheeling	101†	5	100.5	96
Cleveland	103†	3*	95	102
Buffalo	106.5	0	104	104
Birmingham	98	1	104	100
New England*	89†	0	82	90
Cincinnati	95.5	5.5	89	106
St. Louis	94	5	85.5	87
Detroit	104.6	3.7*	103.5	108
Western	109	1	106	101.5
Estimated national rate	100.5	0	101	100

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.
Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

Composite Market Averages

FINISHED STEEL PRICE INDEX	Feb. 24	Feb. 17	Month	February
Bureau of Labor Statistics	1953	1953	Ago	Average
(1947-1949 = 100)	130.5	130.5	130.6	130.5

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Feb. 21, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Tracks spikes	6.650	Sheets, galv.	6.845
Track bolts	9.968	Strip, C.R. carbon	5.160
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.775
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.370	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.349	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb keg)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted

Calculated by STEEL*	Feb. 26 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	134.56
Index in cents per lb	4.912	4.912	4.912	4.657	3.645

ARITHMETICAL PRICE COMPOSITES

Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$81.136
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.54	39.84
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.376
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.48
Steelmaking Scrap, GT	43.00	43.00	43.00	41.00	40.08

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Feb. 26 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R. del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.11	4.11	4.11	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Conshohocken, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.776	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, $\frac{7}{32}$-$\frac{9}{32}$", Pitts.	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton					
Bessemer, Pitts.	$56.50	$55.50	$55.50	$53.00	$40.90
Basic Valley	54.50	54.50	54.50	52.00	39.00
Basic del. Phila.	59.25	59.25	59.25	56.61	42.041
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.541
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry, Birm. del. Cin.	58.93	58.93	58.93	55.43	40.71
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	41.50	41.50	41.50	42.50	41.50
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	44.00	40.25
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	44.00	39.75
No. 1 Heavy Melt, Buffalo	42.75	42.75	44.00	44.00	44.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	49.75
No. 1 Cast, Chicago	44.00	44.00	44.00	44.00	66.00

* F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn. Connlsv.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry. Connlsv.	17.00	17.00	17.00	17.50	14.875
Oven, Fdry. Chicago	24.50	24.50	24.50	23.00	18.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic*	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. B2	50.88	51.38		
Birmingham B2	50.88	51.38		
Birmingham S9		51.38		
Woodward,Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo R2	54.50	55.00	55.50	
Buffalo H1	54.50	55.00	55.50	
Tonawanda,N.Y. W12	54.50	55.00	55.50	
No.Tonawanda,N.Y. T9		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester,N.Y., del.	57.52	58.02	58.52	
Syracuse,N.Y. del.	58.62	59.12	59.62	
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50		55.00	
IndianaHarbor,Ind. I-2	54.50		55.00	
So.Chicago,Ill. W14	54.50	55.00	55.00	
So.Chicago,Ill. Y1	54.50	55.00	55.00	
So.Chicago,Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.		61.30	61.30	
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50			55.50
Duluth I-3			55.00	
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1		59.50	60.00	
Fontana,Calif. K1	60.50	61.00		
GraniteCity,Ill. G4	56.40	56.90	57.40	
St.Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton,Utah C11	54.50	55.00		
Geneva,Utah C11	54.50	55.00		
LoneStar,Tex. L6	50.50	*51.00	51.00	
Minnequa,Colo. C10	56.50	57.50	57.50	
Rockwood,Tenn. T3			58.50	
Pittsburgh District				
Neville Island,Pa. P6		55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Bessemer,Pa. U5	54.50		55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50			
McKeesport,Pa. N3	54.50			55.50
Monessen,Pa. P7	56.50			
Sharpsville,Pa. S6			55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	
Youngstown Y1	54.50	55.00	55.00	
Youngstown U5	54.50			55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25% add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton	
(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G2 J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls,N.Y. P15	$81.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, Off & Fdry., 12½ lb pigets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., Off & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton	
(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Feb. 26, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif. K1 ... 83.00
Houston S5 ... 65.00
Midland,Pa. C18 ... 57.00
Munhall,Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $59.00
Clairton,Pa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 59.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
So.Duquesne,Pa. U5 ... 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 70.50
Canton,O. R2 ... 70.50
Clairton,Pa. U5 ... 70.50
Cleveland R2 ... 70.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.50
Ensley,Ala. T2 ... 70.50
Fairfield,Ala. T2 ... 70.50
Fontana,Calif. K1 ... 86.50
Gary,Ind. U5 ... 70.50
Geneva,Utah C11 ... 70.50
Houston S5 ... 78.50
Johnstown,Pa. B2 ... 70.50
LackawannaN.Y. B2 ... 70.50
LosAngeles B3 ... 89.50
Munhall,Pa. U5 ... 70.50
Seattle B3 ... 89.50
So.Chicago R2,U5,W14 ... 70.50
So.Duquesne,Pa. U5 ... 70.50
So.SanFrancisco B3 ... 89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... 76.00
Buffalo R2 ... 76.00
Canton, O. R2 ... 76.00
Canton,O. T7 ... 78.60
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 79.00
Fontana,Calif. K1 ... 95.00
Gary,Ind. U5 ... 76.00
Houston S5 ... 84.00
Ind.Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 76.00
Munhall,Pa. U5 ... 76.00
So.Chicago R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... $7.50
Canton,O. R2 ... 7.50
Cleveland R2 ... 7.50
Fontana,Calif. K1 ... 10.50
Gary,Ind. U5 ... 7.50
Massillon,O. R2 ... 7.50
So.Chicago,Ill. R2 ... 7.50
So.Duquesne,Pa. U5 ... 7.50

SHEET BARS (NT)
Fontana,Calif. K1 ... 93.18

SKELP
Aliquippa,Pa. J5 ... 3.65
Munhall,Pa. U5 ... 3.55
Warren,O. R2 ... 3.55
Youngstown R2,U5 ... 3.55

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.325
Buffalo W12 ... 4.325
Cleveland A7 ... 4.325
Donora,Pa. A7 ... 4.325
Fairfield,Ala. T2 ... 4.325
Fontana,Calif. K1 ... 5.125
Houston S5 ... 4.725
Johnstown,Pa. B2 ... 4.325
Joliet,Ill. A7 ... 4.325
KansasCity,Mo. S5 ... 4.665
LosAngeles B3 ... 5.125
Minnequa,Colo. C10 ... 4.575
Monessen,Pa. P7 ... 4.525
No.Tonawanda,N.Y. B11 ... 4.325
Pittsburg,Calif. C11 ... 4.975
Portsmouth,O. P12 ... 4.525
Roebling,N.J. R5 ... 4.425
So.Chicago,Ill. R2 ... 4.325
SparrowsPoint,Md. B2 ... 4.425
Sterling,Ill. c1, N15 ... 4.325
Struthers,O. Y1 ... 4.325
Torrance,Calif. C11 ... 5.125
Worcester,Mass. A7 ... 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.50
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind.Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S5 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif. c22, P1 ... 4.56
Phoenixville,Pa. P4 ... 4.95
Seattle B3 ... 4.50
So.Chicago,Ill. U5, W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10

Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 5.05
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725

H.S. L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.80
Bessemer,Ala. T2 ... 5.80
Bethlehem,Pa. B2 ... 5.80
Clairton,Pa. U5 ... 5.80
Fairfield,Ala. T2 ... 5.80
Fontana,Calif. K1 ... 6.45
Gary,Ind. U5 ... 5.80
Geneva,Utah C11 ... 5.80
Ind.Harbor,Ind. I-2 ... 5.80
Ind.Harbor,Ind. Y1 ... 6.30
Johnstown,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
LosAngeles B3 ... 6.35
Munhall,Pa. U5 ... 5.80
Seattle B3 ... 6.40
So.Chicago,Ill. U5 ... 5.80
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.30

H.S. L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
Munhall,Pa. U5 ... 5.75
So.Chicago,Ill. U5 ... 5.75

BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.95
Bessemer,Ala. T2 ... 5.95
Clairton,Pa. U5 ... 5.95
Cleveland J5, R2 ... 5.95
Conshohocken,Pa. A3 ... 6.20
Ecorse,Mich. G5 ... 6.90
Fairfield,Ala. T2 ... 5.95
Fontana,Calif. c30, K1 ... 6.60
Gary,Ind. U5 ... 5.95
Geneva,Utah C11 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Johnstown,Pa. B2 ... 5.95
Munhall,Pa. U5 ... 5.95
Pittsburg,Calif. J5 ... 5.90
Seattle B3 ... 6.85
Sharon,Pa. S3 ... 5.95
So.Chicago,Ill. U5 ... 5.95
SparrowsPoint,Md. B2 ... 5.95
Warren,O. R2 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 5.35
Coatesville,Pa. I7 ... 5.75
Conshohocken,Pa. A3 ... 5.55
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 5.25
Johnstown,Pa. B2 ... 5.25
Munhall,Pa. U5 ... 5.25
Sharon,Pa. S3 ... 5.50
So.Chicago,Ill. U5 ... 5.25
SparrowsPoint,Md. B2 ... 5.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind.Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,Ky. c15, A10 ... 4.15
Cleveland c1 R2 ... 4.50
Warren,O. c1, R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.60
Ashland,Ky. c15, A10 ... 3.60
Bessemer,Ala. T2 ... 3.60
Clairton,Pa. U5 ... 3.60
Claymont,Del. C22 ... 4.35
Cleveland J5, R2 ... 3.60
Coatesville,Pa. I7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.60
Fontana,Calif. c30, K1 ... 4.55
Gary,Ind. U5 ... 3.60
Granite City,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.60
Harrisburg,Pa. C5 ... 4.50
Houston S5 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.60
Johnstown,Pa. B2 ... 3.60
Lackawanna,N.Y. B2 ... 3.60
Minnequa,Colo. C10 ... 4.70
Munhall,Pa. U5 ... 3.60
Pittsburgh J5 ... 3.60
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.60
SparrowsPoint,Md. B2 ... 3.60
Steubenville,O. W10 ... 3.60
Warren,O. R2 ... 3.60
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.60

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.70
Geneva,Utah C11 ... 5.05

PLATES, Wrought Iron
(Add 4.7c to base and extras)
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.50
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2 Y1 ... 3.95
Munhall,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.50
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFran.,Calif. B3 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco S7 ... 5.00

BAR SIZE ANGLES, H.R CARBON
Bethlehem,Pa. B2 ... 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.675
Buffalo R2 ... 4.675
Canton,O. R2 ... 4.675
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.675
Detroit R7 ... 4.825
Ecorse,Mich. G5 ... 5.025
Fontana,Calif. K1 ... 5.725
Gary,Ind. U5 ... 4.675
Houston S5 ... 5.075
Ind.Harbor,Ind. I-2,Y1 ... 4.675
Johnstown,Pa. B2 ... 4.675
KansasCity,Mo. S5 ... 5.275
Lackawanna,N.Y. B2 ... 4.675
LosAngeles B3 ... 5.725
Massillon,O. R2 ... 4.675
Midland,Pa. C18 ... 4.675
So.Chicago R2,U5,W14 ... 4.675
So.Duquesne,Pa. U5 ... 4.675
Struthers,O. Y1 ... 4.675
Warren,O. C17 ... 4.675
Youngstown U5 ... 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H. R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind.Harbor,Ind. I-2 ... 5.925
Indiana Harbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.675
Struthers,O. Y1 ... 6.425
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B5 ... 4.975
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago R8 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.075
Donora,Pa. A7 ... 4.925
Elyria,O. W8 ... 4.925
FranklinPark,Ill. N5 ... 4.925
Gary,Ind. R2 ... 4.925
GreenBay,Wis. F7 ... 4.925
Hammond,Ind. I-2,M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles R2 ... 6.375
Mansfield,Mass. B5 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. M5 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Waukegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B5 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.99
Carnegie,Pa. C12 ... 6.00
Chicago B5 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.05
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Donora,Pa. A7 ... 6.05
Elyria,O. W8 ... 6.00
Gary,Ind. R2 ... 6.00
Hammond,Ind. I-2, M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B5 ... 6.45
Massillon,O. R2, R8 ... 6.00
Midland,Pa. C18 ... 6.00
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
So.Chicago,Ill. R2, W14 ... 6.00
SpringCity,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Waukegan,Ill. A7 ... 6.05
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.95
Atlanta A11 ... 4.50
Buffalo R2 ... 3.95
Cleveland R2 ... 3.95
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.75
Niles,Calif. P1 ... 4.65
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
SandSprings,Okla. S5 ... 4.85
Seattle B3, N14 ... 4.70
So.Chicago,Ill. R2 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
SparrowsPoint,Md. B2 ... 3.95
Sterling,Ill. c1, N15 ... 4.70
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Youngstown R2, U5 ... 3.95

BARS, Reinforcing (Fabricated, to consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ½-1" B2 ... 5.25
KansasCity S5 ... 6.05
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.25
Seattle B3, N14 ... 5.80
SandSprings S5 ... 6.45
So.SanFrancisco B3 ... 5.40
SparrowsPt. ½-1" B2 ... 5.25
Williamsport,Pa. S19 ... 5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin Pa.(3,4) F5 ... 4.75
FortWorth,Tex.(26) T4 ... 5.10
Huntngt.W.Va.(3) W7 ... 5.75
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 4.95
Tonawanda(3,4) R12 ... 5.00
Williamsport(3) S19 ... 5.25
William port(4) S19 ... 5.35

BARS, Wrought Iron
(Add 4.7c to base and extras)
Economy Pa.(S.R.) B14 9.60
Economy Pa.(D.R.) B14 11.90
Economy(Staybolt) B14 12.20
McK Rks.(Staybolt) L5 14.50
McK Rks.(S.R.) L5 9.60
McK Rks.(D.R.) L5 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(8) A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.175
Detroit M1 ... 4.40
Ecorse,Mich. G5 ... 3.925
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.825
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.875
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 5.425
Pittsburg,Calif. C11 ... 4.475
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.725
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. B1 ... 5.825
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.675
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.775
Gary,Ind. U5 ... 5.675
Ind.Harbor,Ind. I-2 ... 5.675
Ind.Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(35) R2 ... 5.675
Munhall,U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(36) B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.475
Fontana,Calif. K1 ... 7.975
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
IndianaHarbor,Ind. I-2 ... 6.925
Irvin,Pa. U5 ... 6.925
Lackawanna(37) B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(38) B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 ... 4.575
Cleveland,Ja. R2 ... 4.575
Coatesville,Pa. A4 ... 4.575
Detroit,Mich. G6 ... 4.775
Fairfield,Ala. T2 ... 4.475
Follansbee,W.Va. F4 ... 4.575
Fontana,Calif. K1 ... 5.675
Gary,Ind. U5 ... 4.575
Granite City,Ill. G4 ... 5.275
Ind.Harbor,Ind. I-2,Y1 4.575
Irvin,Pa. U5 ... 4.575
Lackawanna,N.Y. B2 ... 4.575
Middletown,O. A10 ... 4.575
Pittsburg,Calif. C11 ... 5.525
Pittsburgh,Pa. J5 ... 4.575
Sparrows Point,Md. B2 ... 4.575
Steubenville,O. W10 ... 4.575
Warren,O. R2 ... 4.575
Weirton,W.Va. W6 ... 4.575
West Leechburg,Pa. A4 ... 5.45
Youngstown,O. Y1 ... 4.575

SHEETS, Galv'd No. 10 Steel

Alabama City,Ala. R2 ... 5.675
Ashland,Ky.(8) A10 ... 5.675
Canton,O. R2 ... 5.675
Dolphin,O. N16 ... 5.675
Dover,O. E1 ... 5.775
Fairfield,Ala. T2 ... 5.675
Gary,Ind. U5 ... 5.675
GraniteCity,Ill. G4 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.675
Irvin,Pa. U5 ... 5.675
Kokomo,Ind.(13) C16 ... 5.475
MartinsFerry,O. W10 ... 5.675
Niles,O. N12 ... 6.275
Pittsburg,Calif. C11 ... 5.525
SparrowsPoint,Md. B2 ... 5.675
Steubenville,O. W10 ... 5.675
Torrance,Calif. C11 ... 5.525
Weirton,W.Va. W6 ... 5.675

SHEETS, Galvannealed No. 10, High-Strength Low-Alloy

Irvin,Pa. U5 ... 7.625
SparrowsPoint(39) B2 .. 7.475

SHEETS, Galvannealed Steel

Canton,O. R2 ... 5.625
Irvin,Pa. U5 ... 5.625
Kokomo,Ind.(13) C16 .. 6.025
Niles,O. N12 ... 6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10 ... 5.325
Middletown,O. A10 ... 5.325

SHEETS, Electro Galvanized

Cleveland R2 (28) ... 5.925
Niles,O. R2 (28) ... 5.925
Weirton,W.Va. W6 ... 5.775

SHEETS, Well Casing

Fontana,Calif. K1 ... 5.34

BLUED Stock, 29 ga.

Yorkville,O. W10 ... 7.00
Follansbee,W.Va. F4 ... 7.10
Follansbee (23) F4 ... 6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ... 4.925
Cleveland R2 ... 4.925
Gary,Ind. U5 ... 4.925
GraniteCity,Ill. G4 ... 5.025
Ind.Harbor,Ind. I-2 ... 4.925
Irvin,Pa. U5 ... 4.925
Middletown,O. A10 ... 4.925
Youngstown Y1 ... 4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 ... $6.25
Fairfield,Ala. T2 ... 6.60
Gary,Ind. U5 ... 6.50
GraniteCity,Ill. G4 ... 6.70
Ind.Harbor,Ind. I-2, Y1 6.50
Irvin,Pa. U5 ... 6.50
Niles,O. R2 ... 6.50
Pittsburg,Calif. C11 ... 7.25
Sparrow Point,Md. B2 .. 6.60
Warren,O. R2 ... 6.50
Weirton,W.Va. W6 ... 6.50
Yorkville,O. W10 ... 6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ... 6.10
Gary,Ind. U5 ... 6.10
GraniteCity,Ill. G4 ... 6.30
Ind.Harbor,Ind. Y1 ... 6.10
Irvin,Pa. U5 ... 6.10
Yorkville,O. W10 ... 6.35

SHEETS, Culvert No. 16

	Alloy	Fe
Ashland,Ky. A10	5.875	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor,I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy.,O W10	5.875	
Pittsburg,Cal C11	6.625	
SparrowsPt. B2	5.875	
Torrance,Cal C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10 ... 6.125
Fairfield,Ala. T2 ... 6.125
MartinsFerry,O. W10 ... 6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10 ... 4.025
Cleveland R2 ... 4.375
Ind.Harbor,Ind. I-2 ... 4.025
Warren,O. R2 ... 4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 ... 5.075
Cleveland R2 ... 5.175
Middletown,O. A10 ... 5.075
Warren,O. R2 ... 5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ... 5.325
Canton,O. R2 ... 5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 ... 5.675
Middletown,O. A10 ... 5.675

SHEETS, ALUMINIZED

Butler,Pa. A10 ... 8.425

TIN PLATE, American 1.25 Coke (Base Box)

	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.Cal. C11	9.45	9.70
Sp.Pt.Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. COILS (Cut lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W10 (cut lengths)			7.85	9.10	9.90
Brackenridge,Pa. A4			8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)			8.55	9.80	
IndianaHarbor,Ind. I-2	7.55	7.85	(31)	(41)	
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.65	7.35	7.85		
Vandergrift,Pa. U5		7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10		7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length ½c lower)

Transformer Grade	72	65	58	52
BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2 ... $7.85
Gary,Ind. U5 ... 7.75
Irvin,Pa. U5 ... 7.75
Yorkville,O. W10 ... 7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10 ... $8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5 ... $9.75
Yorkville,O. W10 ... 9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 5.475
Gary,Ind. U5 ... 5.475
Mansfield,O. E6 ... 6.05
Middletown,O. A10 ... 5.475
Niles,O. N12 ... 6.275
Weirton,W.Va. W6 ... 5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ... 5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 ... 9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.30
Fairfield,Ala. T2 ... 5.65
Fontana,Calif. K1 ... 6.55
Gary,Ind. U5 ... 5.65
Ind.Harb.,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y1 ... 6.15
Lackawanna,N.Y. B2 ... 5.70
LosAngeles(25) B3 ... 6.40
Seattle(25) B3 ... 6.65
Sharon,Pa. S3 ... 5.65
So.SanFrancisco(25) B3 6.40
SparrowsPoint,Md. B2 ... 5.70
Warren,O. R2 ... 5.65
Weirton,W.Va. W6 ... 6.10
Youngstown Y1 ... 6.15
Youngstown U5 ... 5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J-5 ... 7.45
Cleveland A7 ... 7.30
Dover,O. G6 ... 8.00
Ecorse,Mich. G5 ... 8.15
Lackawanna,N.Y. B2 ... 7.90
Sharon,Pa. S3 ... 7.30
SparrowsPoint,Md. B2 ... 7.90
Warren,O. R2 ... 7.30
Weirton,W.Va. W6 ... 7.95
Youngstown Y1 ... 7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ... 3.725
Alton,Ill. L1 ... 4.20
Ashland,Ky.(8) A10 ... 3.725
Atlanta,A11 ... 4.275
Bessemer,Ala. T2 ... 3.725
Bridgeport,Conn.(10) S15 4.225
Buffalo(27) R2 ... 3.725
Butler,Pa. A10 ... 3.725
Carnegie,Pa. S18 ... 4.225
Conshohocken,Pa. A3 ... 4.125
Detroit,M1 ... 4.40
Ecorse,Mich. G5 ... 4.025
Fairfield,Ala. T2 ... 3.725
Fontana,Calif. K1 ... 5.175
Gary,Ind. U5 ... 3.725
Houston,Tex. S5 ... 4.125
Ind.Harbor,Ind. I-2,Y1 3.725
Johnstown,Pa.(25) B2 ... 3.725
KansasCity,Mo.(6) S5 ... 4.325
Lackawanna,N.Y.(32) B2 3.725
LosAngeles(25) B3 ... 4.475
Milton,Pa. B6 ... 4.35
Minnequa,Colo. C16 ... 4.275
NewBritain(10) S15 ... 4.225
N.Tonawanda,N.Y. B11 3.725
Pittsburg,Calif. C11 ... 4.475
Riverdale,Ill. A1 ... 3.725
SanFrancisco S7 ... 5.00
Seattle(25) B3 ... 4.725
Seattle N14 ... 4.75
Sharon,Pa. S3 ... 4.225
So.Chicago,Ill. W14 ... 3.725
So.SanFrancisco(25) B3 4.475
SparrowsPoint,Md. B2 ... 3.725
Sterling,Ill. N15 ... 4.725
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.725
Weirton,W.Va. W6 ... 3.825
WestLeechburg,Pa. A4 ... 3.975
Youngstown U5, Y1 ... 3.725

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15 6.05
Carnegie,Pa. S18 ... 6.45
Fontana,Calif. K1 ... 7.30
Gary,Ind. U5 ... 6.10
Houston,Tex. S5 ... 6.50
KansasCity,Mo. S5 ... 6.70
Midland,Pa. C18 ... 6.85
NewBritn.,Conn.(10) S15 6.05
Sharon,Pa. S3 ... 6.45
Youngstown U5 ... 6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ... 5.50
Bridgeprt.,Conn.(10) S15 5.80
Butler,Pa. A10 ... 5.10
Cleveland A7, J5 ... 5.10
Dearborn,Mich. D3 ... 5.05
Detroit D2 ... 5.60
Detroit M1 ... 5.45
Dover,O.(40) G6 ... 5.50
Ecorse,Mich. G5 ... 5.30
Follansbee,W.Va. F4 ... 5.40
Fontana,Calif. K1 ... 6.25
FranklinPark,Ill.(40) T6 5.35
Ind.Harbor,Ind. I-2 ... 5.25
Lackawanna,N.Y. B2 ... 5.10
Los Angeles C1 ... 6.85
Mattapan,Mass. T6 ... 5.95
Middletown,O. A10 ... 5.10
NewBritain(10) S15 ... 5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn.(2) W1			8.55	10.50	
Carnegie,Pa. S18		7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit D2	6.45	7.50	8.10		
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20		
New York W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base		7.65	8.25	10.20	12.50
Worcester,Mass.Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (2)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
New York W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

NewCastle,Pa. B4 ... 5.80
NewCastle,Pa.(40) E5 ... 5.70
NewHaven,Conn. D2 ... 5.85
NewHaven,Conn. A7 ... 5.60
Pawtucket,R.I. R3 ... 6.45
Pawtucket,R.I.(21) N8 ... 6.30
Riverdale,Ill.(40) A1 ... 5.35
Rome,N.Y. R6 ... 5.10
Sharon,Pa. S3 ... 5.80
SparrowsPoint,Md. B2 ... 5.10
Trenton,N.J. R5 ... 6.45
Wallingford,Conn. W2 ... 6.30
Warren,O.(40) T5 ... 5.70
Warren,O. R2 ... 5.10
Weirton,W.Va. W6 ... 5.10
YoungStown C8 (40) ... 5.70
Youngstown Y1 ... 5.10

STRIP, Electro Galvanized

Dover,O. G6 ... 5.50
Warren,O. T5 ... 5.70
Weirton,W.Va. W6 ... 5.10
Youngstown C8 ... 5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10) S15 12.15
Carnegie,Pa. S18 ... 12.00
Cleveland A7 ... 11.40
Dover,O. G6 ... 11.90
Fontana,Calif. K1 ... 13.65
Harrison,N.J. C18 ... 12.00
Midland,Pa. C18 ... 12.00
NewBritn.,Conn.(10) S15 12.15
Pawtucket,R.I.(41) N8 12.15
Pawtucket,R.I.(42) N8 12.45
Sharon,Pa. S3 ... 12.00
Worcester,Mass. A7 ... 11.70
Youngstown C8 ... 12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ... 3.975
Warren,O. R2 ... 4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ... 5.70

TIGHT COOPERAGE HOOP

Atlanta,A11 ... 4.45
Riverdale,Ill. A1 ... 4.30
Sharon,Pa. S3 ... 4.55
Youngstown U5 ... 4.15

* Plus 1.375 per 100 lb

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bonardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C6 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Geneva Steel
C12 Columbia Steel & Shaft.
C14 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G6 Great Lakes Steel Corp.
G8 Greer Steel Co.
H3 Hanna Furnace Corp.
I-1 Ingo Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J4 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Lacede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L4 Lockfast Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
Alabama City B2	6.05	6.35
Aliquippa Ja	6.05	6.35
Atlanta AH	6.35	6.65
Bartonville, Ill. K4	6.05	6.40
Buffalo W12	6.05	6.35
Cleveland A7	6.05	6.25
Crawfordsville, Ind. M8	6.15	6.45
Donora, Pa. A7	6.05	6.25
Duluth, Minn. A7	6.05	6.25
Fairfield T2	6.05	6.25
Houston, Tex. S8	6.45	6.70
Johnstown B2	6.05	6.45
Joliet, Ill. A7	6.05	6.25
Kansas City, Mo. S8	6.65	7.00
Kokomo C16	6.15	6.45
Los Angeles B3	7.025	
Minnequa C10	6.35	6.70
Monessen P7	6.05	6.45
Palmer W12	6.35	
Pitts., Calif. C11	7.025	7.15
Pittsmith (Ind.) P12	6.45	
Rankin A7	6.05	6.25
So. Chicago B2	6.05	6.35
So. S. Fran. C10	7.025	7.40
Sparrows Pt. B2	6.15	6.60
Sterling, Ill. (4) N15	6.05	6.35
Struthers, O. Y1	6.05	6.45
Torrance, Cal. C11	7.025	
Worcester A7	6.35	6.65

*Based on 11c zinc; 11.50c zinc, 17.5c zinc.

WIRE (16 gage)	Anl'd.	Galv. Stone
(Add 4 c.w. on base and extras)		Stone
Aliquippa Ja	10.15	12.15
Bartonville, Ill. K4	10.25	12.00*
Cleveland A7	10.25	11.50
Crawfordsville, Ms	10.45	12.51
Fostoria, O. S1	10.10	13.00
Johnstown B2	10.45	12.85
Kokomo C16	10.625	12.325
Minnequa C10	10.10	12.15*
Palmer, Mass. W12	10.25	12.15
Pitts., Cal. C11	10.60	11.90
Sparrows Pt. B2	10.35	12.65
Sterling (4) N15	10.75	12.10
Waukegan A7	10.25	11.60
Worcester A7		11.80

*Based on 11c zinc, $14.50c zinc. (Includes 1.7c increase.

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. B2	5.225
Aliquippa, Pa. Ja (42)	4.85
Atlanta AH	5.475
Alton, Ill. L1	5.40
Bartonville, Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.40
Cleveland A7 C20	5.225
Crawfordsville, Ind. M8	5.325
Donora, Pa. A7	5.225
Duluth, Minn. A7	5.225
Fairfield, Ala. T2	5.225
Fostoria, O. (24) S1	5.225
Houston S8	5.625
Johnstown, Pa. B2	5.225
Joliet, Ill. A7	5.225
Kansas City, Mo. S8	5.825
Kokomo, Ind. C16	5.325
Los Angeles B3	6.175
Minnequa, Colo. C10	5.475
Monessen, Pa. P7	5.225
Newark 6-8 ga. I-1	5.88
No. Tonawanda B11	5.225
Palmer, Mass. W12	5.525
Pittsburg, Calif. C11	6.175
Portsmouth, O. P12	5.625
Rankin, Pa. A7	5.225
So. Chicago, Ill. B2	5.225
So. San Francisco C10	6.175
Sparrows Point, Md. B2	5.325
Sterling, Ill. (4) N15	5.225
Struthers, O. Y1	5.225
Torrance, Calif. C11	6.175
Waukegan, Ill. A7	5.225
Worcester, Mass. A7	5.425

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	6.20
Butler W12 (43)	6.35
Cleveland A7 (43)	6.40
Crawfordsville, Ind. M8 (43)	6.40
Dover, O. O6	6.20
Fostoria, O. S1 (43)	6.00
Kokomo, Ind. C16 (43)	6.50
Franklin Park, Ill. T6 (43)	6.20
Massillon, O. R8 (43)	6.50
Monessen, Pa. P16 (43)	6.35
Monessen, Pa. P7 (43)	6.10
Pawtucket, R.I. (12) N8 (43)	6.50
Trenton, N.J. R6 (43)	6.15
Worcester, Mass. A7 (43)	6.15
Worcester, Mass. T6 (43)	6.40
Worcester, Mass. W12 (43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville, Ill. K4	8.90
Monessen, Pa. P16 (43)	8.50
Muncie, Ind. I-7 (43)	8.70
Roebling, N.J. R6 (43)	8.80
Sparrows Pt., Md. B2 (43)	8.60
Tonawanda, N.Y. B2 (43)	8.50

ROPE WIRE

Alton, Ill. L1 (43)	8.75
Bartonville, Ill. K4	8.95
Buffalo W12 (43)	8.75
Fostoria, O. S1 (43)	8.85
Johnstown, Pa. B2 (43)	8.85
Monessen, Pa. P16 (43)	8.80
Monessen, Pa. P7 (43)	8.80
Muncie, Ind. I-7 (43)	8.75
Palmer, Mass. W12 (43)	8.85
Portsmouth, O. P12 (43)	8.80
Roebling, N.J. R6 (43)	8.80
Sparrows Pt., Md. B2 (43)	8.65
Struthers, O. Y1 (43)	8.85
Worcester, Ja, T6 (43)	8.85

(A) Plow and Mild Plow, 43 to 2.2c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa, Pa. Ja (43)	6.20
Alton, Ill. L1 (43)	6.60
Bartonville, Ill. K4	6.60
Buffalo W12 (43)	6.20
Cleveland A7 (43)	6.20
Donora, Pa. A7 (43)	6.20
Duluth, Minn. A7 (43)	6.20
Fostoria, O. S1 (43)	6.20
Millbury (12) N6 (43)	8.60
Minnequa, Colo. C10 (43)	6.50
Monessen, Pa. P7 (43)	6.20
Monessen, Pa. P16	6.60
Muncie, Ind. I-7 (43)	6.45
Palmer, Mass. W12 (43)	6.50
Pittsburg, Calif. C11 (43)	7.20
Roebling, N.J. R6 (43)	6.50
Portsmouth, O. P12 (43)	6.20
So. Chicago, Ill. B2 (43)	6.20
So. San Fran. C10 (43)	7.20
Struthers, O. Y1 (43)	6.20
Sparrows Pt., Md. B2 (43)	6.35
Trenton, N.J. A7 (43)	6.55
Waukegan, Ill. A7 (43)	6.20
Worcester, A7, T6 (43)	6.50
Worcester, Mass. W12 (43)	6.50
Worcester, Mass. H (43)	6.70

WIRE, Upholstery Spring

Aliquippa, Pa. Ja	6.25
Alton, Ill. L1	6.50
Buffalo W12	6.25
Cleveland A7	6.25
Donora, Pa. A7	6.25
Duluth, Minn. A7	6.25
Johnstown, Pa. B2	6.25
Los Angeles B3	7.225
Minnequa, Col. C10	6.525
Monessen, Pa. P7	6.275
Monessen, Pa. P16 (42)	6.40
New Haven, Conn. A7	6.575
Palmer, Mass. W12	6.575
Pittsburg, Calif. C11	7.225
Portsmouth, O. P12	6.275
Roebling, N.J. R6	6.375
So. Chicago, Ill. B2	6.275
So. San Francisco C10	7.225
Sparrows Point, Md. B2	6.375
Torrance, Calif. C11	7.225
Trenton, N.J. A7	6.575
Waukegan, Ill. A7	6.275
Worcester, Mass. A7	6.275

WIRE, Fine & Weaving (8 Coils)

Alton, Ill. L1 (43)	9.20
Bartonville, Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawfordsville, Ind. M8 (43)	8.90
Fostoria, O. S1 (43)	8.90
Johnstown, Pa. B2 (43)	8.90
Kokomo, Ind. C16 (43)	8.90
Monessen, Pa. P16 (43)	8.90
Muncie, Ind. I-7 (43)	9.10
Palmer, Mass. W12	9.575
Roebling, N.J. R6 (43)	9.20
Waukegan, Ill. A7 (43)	8.90
Worcester, Mass. A7, T6 (43)	8.90

WIRE, Tire Bead

Bartonville, Ill. K4	11.51
Monessen, Pa. P16 (43)	11.40
Roebling, N.J. R6 (43)	11.50

WOVEN FENCE, 9-15½ Ga. Col.

Alabama City, Ala. B2	132
Ala. City, Ala. (7-15ga.) B2	222
Aliquippa, Pa. (9-11 ga.) Ja	126
Atlanta, Ill. AH	140
Bartonville, Ill. (Pvt.) K4	137
Crawfordsville, Ind. M8	138
Donora, Pa. A7	133
Duluth, Minn. A7	133
Fairfield, Ala. T2	133
Houston, Tex. S8	144
Johnstown, Pa. B2	138
Johnstown, Pa. (6" B2	229
Joliet, Ill. A7	132
Kansas City, Mo. S8	146
Kokomo, Ind. C16	140
Minnequa, Colo. C10	146*
Monessen, Pa. P7	138
Pittsburg, Calif. C11	156
Rankin, Pa. A7	133
So. Chicago, Ill. B2	135
Sterling, Ill. (4) N15	136

*Based on 11c zinc, 17.5c zinc

FENCE POSTS — Col.

Chicago Hts., Ill. C2	110
Duluth, Minn. A7	133
Franklin, Pa. F6	116
Huntington, W.Va. W7	118
Johnstown, Pa. B2	118
Marion, O. P11	110
Minnequa, Colo. C10	135
Moline, Ill. B2	136
So. Chicago, Ill. B2	109
Tonawanda, N.Y. B12	118
Williamsport, Pa. S10	126

WIRE, Barbed — Col.

Alabama City, Ala. B2	141
Aliquippa, Pa. Ja	118*
Atlanta, Ill. AH	149
Bartonville, Ill. (Pvt.) K4	146
Crawfordsville, Ind. M8	147
Donora, Pa. A7	142
Duluth, Minn. A7	142
Fairfield, Ala. T2	142
Houston, Tex. S8	154
Johnstown, Pa. B2	145
Joliet, Ill. A7	142
Kansas City, Mo. S8	158
Kokomo, Ind. C16	149
Minnequa, Colo. C10	153*
Monessen, Pa. P7	147
Pittsburg, Calif. C11	162
Rankin, Pa. A7	142
So. Chicago, Ill. B2	144
So. San Fran., Calif. C10	162*
Sparrows Point, Md. B2	147
Sterling, Ill. (4) N15	145

*Based on 11c zinc, 17.5c zinc

BALE TIES, Single Loop — Col.

Alabama City, Ala. B2	132
Atlanta, Ill. AH	136
Bartonville, Ill. (Pvt.) K4	132
Crawfordsville, Ind. M8	132
Donora, Pa. A7	132
Duluth, Minn. A7	132
Fairfield, Ala. T2	132
Joliet, Ill. A7	132
Kansas City, Mo. S8	144
Kokomo, Ind. C16	134
Minnequa, Colo. C10	137
Pittsburg, Calif. C11	156
So. Chicago, Ill. B2	132
So. San Fran., Calif. C10	156
Sparrows Point, Md. B2	134
Sterling, Ill. (4) N15	132

TRACK BOLTS (20) Treated

Kansas City, Mo. S8 (46)	9.85
Lebanon, Pa. (31) B2	9.85
Minnequa, Colo. C10	9.85
Pittsburgh (6), P11	9.85

AXLES

Ind. Harbor, Ind. S13	5.65
Johnstown, Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala. B2	127
Aliquippa, Pa. Ja	127
Atlanta, Ill. AH	130
Bartonville, Ill. (Pvt.) K4	127
Chicago, Ill. W13	127
Cleveland, A7 (44)	125
Crawfordsville, Ind. M8	127
Donora, Pa. A7	127
Duluth, Minn. A7	127
Fairfield, Ala. T2	127
Galveston, Tex. I47	135
Houston, Tex. S8	135
Johnstown, Pa. B2	127
Joliet, Ill. A7	127
Kansas City, Mo. S8	139
Kokomo, Ind. C16	129
Minnequa, Colo. C10 (44)	123
Monessen, Pa. P7	127
Pittsburg, Calif. C11	146
Portsmouth, O. P12	132
Rankin, Pa. A7	127
So. Chicago, Ill. B2	127
Sparrows Pt., Md. B2	129
Sterling, Ill. (4) N15	127
Torrance, Calif. C11	147
Worcester, Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala. B2	126
Aliquippa, Pa. Ja	126
Atlanta, Ill. AH	129
Bartonville, Ill. (Pvt.) K4	126
Chicago W13	127
Crawfordsville, Ind. M8	128
Donora, Pa. A7	126
Duluth, Minn. A7	126
Fairfield, Ala. T2	126
Johnstown, Pa. B2	126
Joliet, Ill. A7	126
Kokomo, Ind. C16	128
Minnequa, Colo. C10 (45)	123
Monessen, Pa. P7	127
Pittsburg, Calif. C11	145
Portsmouth, O. P12	132
Rankin, Pa. A7	126
So. Chicago, Ill. B2	126
Sparrows Pt., Md. B2	128
Sterling, Ill. (4) N15	126
Torrance, Calif. C11	146
Worcester, Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa. A3	$7.80
Wheeling, W.Va. W10	7.80

TIE PLATES

Fairfield, Ala. T2	4.775
Gary, Ind. U8	4.775
Ind. Harbor, Ind. I-2	4.775
Lackawanna, N.Y. B2	4.775
Minnequa, Colo. C10	$65.50*
Pittsburg, Calif. C11	4.925
Seattle B3	4.925
Steelton, Pa. B2	4.775
Torrance, Calif. C11	4.925

JOINT BARS

Bessemer, Pa. U8	4.925
Fairfield, Ala. T2	4.925
Ind. Harbor, Ind. I-2	4.925
Joliet, Ill. U8	4.925
Lackawanna, N.Y. B2	4.925
Minnequa, Colo. C10	4.925
Steelton, Pa. B2	4.925

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1	6.65
Kansas City, Mo. S8	6.90
Lebanon, Pa. B2	6.65
Minnequa, Colo. C10	6.65
Pittsburgh, Pa.	6.65
Seattle B3	7.15
So. Chicago, Ill. B2	6.65
Struthers, O. Y1	6.65
Youngstown B12	6.65

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer, Pa. U8	3.725	3.625	3.725	4.25
Ensley, Ala. T2	3.725	3.625		4.25
Fairfield, Ala. T2				4.25
Gary, Ind. U8	3.725	3.625	3.725	
Huntington, W.Va. W7				5.25
Indiana Harbor, Ind. I-2	3.725	3.625	3.725	
Johnstown, Pa. B2				(16) 4.25
Lackawanna, N.Y. B2	3.725	3.625		4.25
Minnequa, Colo. C10	$25.50*	$23.50*		4.75
Steelton, Pa. B2	3.725	3.625		
Williamsport, Pa. S10				5.00

*Per net ton.

TOOL STEEL

(Prices subject to 4.7c increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.565
18	4	2		1.65-1.66
20	2	4	25	1.6 12 25 3.53 3.675
18	4	2	7	2.460
18	2	4	25	1 4.75 2.125
18	4	2	5	2.445-2.45
13	5	4	3	1.602
⅝	3	25	0.5	1.01

W	Cr	V	Mo	
6	4	1.5	1.5	0.96 0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

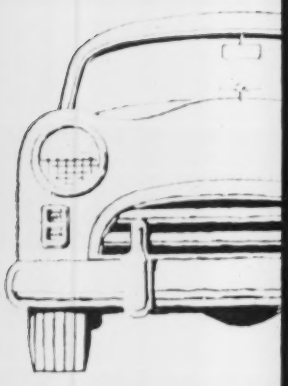
Tool steel producers include: AL, AS, B2, B5, C4, C6, C12, C18, D1, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Anchor, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Chicago or Birm. base.
(6) To jobbers, 3 rails, base.
(7) 16 gage and heavier.
(8) 6 lb. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. Base.
(13) A11 0.2c for 12 to 6 & heavier.
(14) 5" and thinner.
(16) 40 lb. and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.2c off for untreated.
(21) New Haven Conn. base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 26" wide.
(24) Jobber 0.20c, Other than Ga.
(25) Rail mill basis.
(26) Reinforcing, mill lengths, to fabricators or consumers, 2.85c.
(27) Rail mill sizes.
(28) Basing point.
(29) Add 3.1c per ton.
(30) Sheared; add 0.15c for universal mill.
(31) Not annealed.
(32) 8d or square edge.
(33) To jobbers, deduct 20c.
(34) 5" and narrower.
(35) 12 gage & lighter, 60" & narrower.
(36) 14 gage & lighter 48" & narrower.
(37) 18" and narrower.
(40) Lighter than 0.055", 0.055" and heavier, 0.25c higher.
(41) 3.10c for cut lengths.
(42) Plus 0.15c per 100 lb.
(43) Plus 4.5% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cwt.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midland Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O8 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R4 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Super-ior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S21 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube



This intricate maze of metal is the valve section of a popular automatic transmission, cast in Gray Iron.

6 Reasons why the final choice was GRAY IRON!

1. Greater rigidity, strength and dimensional stability
2. Greater accuracy—can be held to closer tolerances
3. Greater wear resistance
4. Does not permit dirt to imbed, as do the softer nonferrous materials
5. Desirable thermal expansion characteristics
6. Economy

Intricate components such as the section shown here are economically practical only as integral castings. The final question then becomes—in what material shall they be cast?

This valve section was first experimentally cast in a nonferrous material. However, the final choice was Gray Iron, for the practical reasons listed at the left. These same basic advantages of Gray Iron could well apply to one of *your* current design problems.

Write for technical information on the many advantages of the Gray Iron casting process.

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Second largest industry in the metal-working field

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NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft.	.363	.493	.637	.833	1.09	1.41	1.67	2.23	3.53	4.85
Pounds Per Ft.	.85	1.13	1.68	2.28	2.71	3.61	4.10	5.52	7.62	

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (c) (e)	32 5	13 25	33 5	18 25	38		20 75	38 5	20 5		39	21	39 5	21 5	40		21 25	40		21 25
Alton, Ill. L1 (c) (e)	29 5	16 5	32 5	14 5	35		18	35 5	18 5		36	19 5	36 5	20	37		20 5	37		20 5
Benwood, W. Va. W10	32 5	13 25	33 5	17 25	38		20 75	38 5	20 5		39	21 5	39 5	22	40		21 75	40		21 75
Etna, Pa. N2 (c) (e)	32 5	13 25	33 5	17 25	38		20 75	38 5	20 5		39	22 25	39 5	23	40		21 75	40		21 75
Fontana, Calif. K1 (c)	19 5	0 25	22 5	4 25	25		7 25	25 5	7 5		26	8	26 5	8	27		8 75	27		8 75
Ind. Harbor, Ind. Y1 (c) (e)	31 5	14 25	34 5	18 25	37		21 75	37 5	21		38	22	38 5	22 25	39		21 75	39		21 75
Lorain, O. N3 (c) (e)	32 5	13 25	33 5	16 25	38		20 75	38 5	27 25		39	28 25	39 5	28 75	40		26 25	40		26 25
Sharon, Pa. M6	32 5	14 25	33 5	18 25	38		21 25	38 5	20 50		39	21 00	39 5	21 50	40		20 75	40		20 75
Sparrows Pt., Md. B2	30 5	11 25	33 5	15 25	36		18 75	36 5	18 5		37	19 5	37 5	20	38		19 75	38		19 75
Youngstown, B2 (c) (e)	32 5	16 25	33 5	20 25	38		23 75	38 5	22 75		39	23 75	39 5	24 25	40		23 25	40		23 25
Youngstown, Y1 (c)	32 5	13 25	33 5	16 25	38		22 75	38 5	22 00		39	23 00	39 5	23 50	40		22 75	40		22 75
Wheatland, Pa. W9	32 5	13 25	33 5	16 25	38		18 75	38 5	19		39	19 5	39 5	20	40		20 25	40		20 25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft.	.476	.568	.766	.926	$1.09	$1.48	$1.92
Pounds Per Ft.	3.68	5.82	7.62	9.20	10.88	14.81	18.78

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (c) (e)	24	6	27	8 25	27	8 25	29	10 25	29	10 25	33 5	14	33 5	13
Ambridge, Pa. N2	24	6	27	8 25	27	8 25	29	10 25	29	10 25	33 5	14	33 5	13
Lorain, O. N3 (c) (e)	24	12 75	27	12 75	27	12 75	29	14 75	29	14 75	33 5	19 5	33 5	19 5
Youngstown, Y1 (c) (e)	24	7 50	27	9 25	27	9 25	29	11 25	29	11 25	33 5	16	33 5	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (c) (e)	24	8 25	27	9 75	27	9 75	29	11 75	29	11 75	33 5	16 5	33 5	16 5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1
List Per Ft.	.306	.40	.54	.730	.920	$1.09
Pounds Per Ft.	.24	.42	.57	.85	1.20	10.88

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	26 5	0 25	23 25	3 5	17 75	7 75	33	11 25	33	14 25		
Butler, Pa. E6 (c) (e)	30 5	1 25	25	1 75	20	5 5						
Etna, Pa. N2 (c) (e)	30 5	1 25	25	1 75	20	5 5	33	14 25	33	14 25		
Sharon, Pa. M6 (c) (e)	26 5	1 75	23	2 25	18	6 25						
Sharon, Pa. S1 (c) (e)	30 5	1 25	25	1 75	20	5 5						
Sparrows Pt., Md. B2	28 5	0 75	23	3 75	18	7 50						
Youngstown, R2 (c) (e)							33	15 75	33	15 75		
Wheatland, Pa. W9	28 5	0 75	23	3 75	18	7 50						

Galvanized pipe discounts based on zinc price of ... (c) He, (c) 12.5c, (c) 11.5c (c) 10c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill, minimum wall thickness cut lengths 10 to 24 ft., inclusive

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14 19	16 71 17 77	16 20	16 20
1¼	13	16 97	19 58 21 26	16 46	19 16
1½	13	18 22 18 77	22 08 22 82	18 19	21 41
1¾	13	20 34 21 34	24 92 25 19	20 69	24 33
2	13	22 81 23 93	27 94 28 58	23 19	27 28
2¼	13	25 69 26 66	31 38 32 18	25 84	30 42
2½	12	28 16 29 36	34 56 36 58	28 16	33 46
2¾	12	31 28 32 17	37 83 39 19	31 19	36 67
3	12	33 87 34 82	40 99 42 11	33 69	38 96
3½	12	36 78 36 87	42 11 44 93	34 98	40 82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Each, midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter

⅜-in. & smaller diam.	15
⅜-in. & ⅞-in.	18 5
1-in. and larger	17 5
Longer than 6 in.	
All diams.	11
Lag bolts, all diams.	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18 5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting Up Bolts	31

NUTS

	Reg. Hex	Hvy. Square
H.P. & C.P.		
½-in. & smaller	1	1
⅝-in. & ¾-in.	12	6 5
⅞-in. & 1-in.	4	
1 1/8-in. & larger	7 5	1
H.P. Hex		
½-in. & smaller	26	22
⅝-in. & ¾-in.	24	6 5
⅞-in. & 1-in.	12	2
1 1/8-in. & larger	5 5	2
C.P. Hex		
½-in. & smaller	26	22
⅝-in. & ¾-in.	24	17 5
⅞-in. & 1-in.	12	6 5
1 1/8-in. & larger	12	6 5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case of keg quantities)

	Reg. Hex	Hvy. Square
½-in. & smaller	35	28 5
⅝-in. & ¾-in.	29 5	22
⅞-in. & 1-in.	24	15
1 1/8-in. & larger	15	8 5
Lock		Light
½-in. & smaller	35	17 5 to 20
⅝-in. to 1-in.		31 50
1 1/8-in. to 1½-in.		28 5
1¾-in. to 2-in.		26

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1-in. diam. x 6 in. and shorter	38
1-in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(Each, plain, per cent off list, packaged)

Plain finish	18 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1024 steel, packaged, per cent off list)

6 in. or shorter	
⅜-in. & smaller	42
½-in. through 1-in.	34
Longer than 6 in.	
⅜-in. and smaller	26
½-in. through 1-in.	4

RIVETS

(Each, midwestern plants)

Structural ½-in. diam. & larger 7.5c

½-in. under 26 off

ELECTRODES

(Threaded with nipples and boxed, each, plants)

GRAPHITE

Inches Diam.	Length	Cents per lb
17 18-20	60 72	17 5c
5 to 16	48 60 72	17 5c
4	48 60	19 5c
3	48 60	20 5c

CARBON

110	8 0c
65 to 110	8 0c
72 to 101	8 0c
31 50	8 0c

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvl fur.	$11.50-12.00
Connellsvl fdy.	16.50-17.00
New River foundry	20.00
Wise county, foundry	15.00
Wise county, furnace	13.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$21.00
Everett, Mass. ovens	
New England del.	26.65
Chicago ovens	21.50
Chicago del.	26.00
Terre Haute ovens	21.65
Milwaukee ovens	23.25
Indianapolis ovens	24.25
Chicago del.	28.12
Cincinnati del.	25.85
Painesville, O. ovens	23.50
Cleveland del.	27.43
Erie, Pa. ovens	23.00
Birmingham, ovens	21.50
Cincinnati del.	26.35
LoneStar, Tex. ovens	18.50
Philadelphia ovens	23.95
Swedeland, Pa. ovens	23.55
St. Louis, ovens	
St. Louis del.	26.00
Portsmouth, O. ovens	24.00
Cincinnati del.	26.62
Detroit, ovens	25.50
Detroit del.	26.50
Buffalo del.	28.05
Flint del.	28.25
Pontiac del.	27.00
Saginaw del.	25.50

Or within $1.50 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	30.00-35.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia $41 f.o. Cents per pound, ovens

Phenol, 56 carlots, ton, returnable drums 17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF2 content 70%, $42.50; 60%, $40

Imported, net ton, duty paid, metallurgical grade, $33-$35

NOTE: Current prices on clad steels appeared on page 115, Feb. 16 issue.

STAINLESS STEEL

(Add 4.7c on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41 00	41 00	31 25
302	41 25	36 75	31 50
303	43 25	40 25	34 00
304	44 25	48 75	33 00
305	46 00	46 00	44 75
316	72 00	56 00	49 25
321	49 25	48 25	37 00
347	53 75	62 25	41 00
410	36 00	30 50	25 75
416	37 00	37 00	26 25
420	41 00	47 00	31 25
430	36 00	31 00	26 25
501	27 50	26 00	14 25
502	28 50	27 00	16 25

Bait, Types 301-347 and 430 sheets, except 301 and 302 B2

Brackenridge, Pa., sheets A1 quotes slight variations on Types 301-347

Bridgeville, Pa., bars, wire, sheets & strip E4

Butler, Pa., sheets and strip except Types 301, 305, 416, 420, 501 & 502, A10

Carnegie, Pa., sheets and strip except Types 301, 416, 501 & 502, S18

Cleveland, strip A7

Detroit, strip M1 quotes 34.00c on Type 301, 36.50c; 302, 38.50; 304, 45.50; 316, 52.00c; 347, 50.50; 410, 31.00c; 430

Dunkirk, N. Y., bars, wire A1 quotes slight variations on Types 301-347

Duquesne, Pa., bars U5

Fort Wayne, Ind., bars and wire except Types 501 & 502 J6 quotes slight variations on Types 301-347

Gary, Ind., sheets except Type 416 U5

Harrison, N. J., strip and wire C5

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.00c; Type 316, 51.00c, including 4.7c increase on base price

Massillon, O., all items R2

McKeesport, Pa., strip Type 410, bars & wire, Types 410 through 430 and 31 2-in. on Type 302, 33.50c; on 304, 32.25c; on 304L 48.25c on 316, 36.75c; on 321, 41.25c; on 347 F2

McKeesport, Pa., bars, sheets except Type 416 U5

Middletown, O., sheets and strip except Types 301, 416, 420, 501 and 502 A10

Midland, sheets & strip C15

Munhall, Pa., bars U5

Muncie, Ind., wire 1-7 quotes Types 302, 304, 430

Pittsburgh, sheets C15

Reading, Pa., strip except 31 2-in. on Type 301 and 46.00c on 305, bars except 31.50c on Type 301 and 45.25c on 305 C4

Sharon, Pa., strip, except Types 301, 305, 416, 501, 502 and 31 2-in. on Type 304L S3

So. Chicago, Ill., bars & structurals U5

Syracuse, N. Y., bars, wire & structurals C15

Titusville, Pa., bars L4

Wallingford, Conn., strip W2 quotes 0.2c higher

Washington, Pa., bars, sheets & strip, except 0.2c higher on Type 304L E4

Washington, Pa., Types 301 through 347 sheets & strip except 304, 305, 316, sheets 62.00c; strip 61.00c W4

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347

Waukegan, bars & wire A7

West Leechburg, Pa., strip, A1 quotes slight variations on Types 301-347

Youngstown, strip except Types 301, 305, 316, 416, 501 and 502 and 31 2-in. on Type 304L C5

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98.5% Fe, annealed	15 00
Unannealed	14 00
Swedish, c.l. N.Y. c.l. in bags	10 00
Electrolytic iron	
Annealed, 99.5% Fe	42 00
Unannealed (99% Fe)	36 00
Unannealed (99% Fe), minus 325 mesh	53 00
Powder Flakes	45 00
Carbonyl Iron	
97.9-99.8% size c.t. to microns	$1.00-145.00
Aluminum	
Carlots, freight allowed	31 00
Atomized, 500 lb drums, freight allowed	33 00
Antimony, 500 lb lots	71 00
Brass, 20 ton lots	31 00-34 25
Bronze, Bi ton lots	31 25-60 00
Phosphor Copper, 20 ton lots	50 00
Copper	
Electrolytic	37 25
Reduced	35 25
Lead	7 40
Magnesium	2.00-52.00
Manganese	
Minus 100 mesh	57 00
Minus 35 mesh	52 00
Minus 200 mesh	62 00
Nickel, unannealed	86 00
Nickel-Silver, 5 ton lots	46 00
Silicon	38 50
Solder	8 50*
Stainless Steel, 302	83 00
Zinc, 10 ton lots	14 00-31 00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh, 1000 lb and over	5 50
Less than 1000 lb	6 00
Molybdenum, 99.9% minus 200 mesh	3 24
Chromium, electrolytic 99.9% Cr min.	3 50

* Plus cost of metal

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Deoxidation Studies Show Advantages of Silicomanganese

Silicomanganese has proved to be highly efficient and economical as a furnace block and deoxidizer, as well as an alloy addition. Steel producers have found that it saves furnace time, produces cleaner steel and increases the yield of rolled products.

Excellent Blocking Addition

When used as a blocking addition, silicomanganese stops the carbon-oxygen reaction in the open-hearth furnace and permits close control of analysis. The alloy has a ratio of approximately 3.5 manganese to 1 silicon. This proportion will produce a high degree of deoxidation in the furnace.

Why Silicomanganese Is Effective

The carbon boil is arrested more positively by this combination alloy, containing both silicon and manganese, than it is by larger amounts of silicon alone. As a result, close control of the carbon level can be maintained. Also, because of the low carbon content of silicomanganese, the heat may be blocked at a comparatively high carbon level. This saves furnace time, which is critical in reducing costs. Since silicomanganese gets more oxygen out of the bath than silicon alone, the steel is cleaner and has improved surface quality.

Metallurgical Studies Made

Work done by Herty and his associates [1] showed that manganese tends to flux silica inclusions resulting from deoxidation, and permits them to grow in size so that they float out of the bath more rapidly.

More recently, it was found by Hilty and Crafts [2] that manganese and silicon in combination lower the oxygen content much more than silicon alone (see Fig. 1). They also determined that, although manganese by itself is not a strong deoxidizer, it substantially intensifies the deoxidizing power of silicon.

It was shown that in steels with lower silicon contents (below 0.05 per cent), manganese in the amounts usually present as a residual has a strong influence. However, in the silicon range normally used for

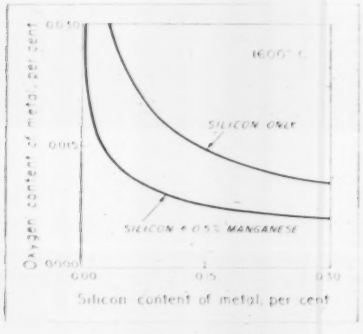

Fig. 1. Limit of solubility of oxygen in iron-silicon alloys, plain and with 0.50 per cent manganese at 1600 deg. Centigrade.

deoxidation (0.05 to 0.25 per cent), more manganese is required to obtain the full benefit of the combined deoxidizers. For example, at 1600 deg. C. iron with 0.10 per cent silicon and 0.10 per cent or less manganese contains about 0.01 per cent oxygen. With 0.50 per cent manganese, it contains only 0.004 per cent oxygen (see Fig. 1).

These data thus confirm an observation made by Tenenbaum and Brown [3] that steel as tapped from the furnace is materially lower in oxygen after blocking with silicomanganese.

In another study, made by Silliman and Forsyth [4], it was demonstrated that heavier than usual additions of silicomanganese result in a marked improvement in surface quality. About twice the usual addition of silicomanganese gives a substantial increase in the yield of finished product.

Silicomanganese Produces Cleaner Steel

Initial deoxidation in the furnace with silicomanganese produces very clean steel, particularly in grades below 0.25 per cent carbon. Several factors contribute to the cleansing action of silicomanganese. The amount of dirt in steel seems to be proportional to the maximum oxygen content prior to final deoxidation. Heats that are oxidized to a low carbon and recarburized, as were early rail and forging steels, are dirtier than those in which the carbon is "caught on the way down."

It is also well recognized that medium-manganese and low carbon steels that are blocked at higher carbon (lower oxygen) contents, with low carbon ferroalloys, are cleaner than those taken to a lower carbon level and recarburized with high carbon ferroalloys. Silicomanganese is low enough in carbon to block at higher carbon levels. As pointed out by Tenenbaum [5], there is also a decided economic advantage in not driving to such low carbon contents before blocking.

Suitable For Ladle Additions

In addition to its use as a bath deoxidizer, silicomanganese has proved particularly effective as a ladle addition for the deoxidation of semi-killed steels. The alloy is also used to provide the complete ladle addition of manganese in the manufacture of medium manganese, acid steel castings.

Metallurgical Service Available

Our metallurgists will be glad to help you with the use of Electromet silicomanganese. This alloy contains 65 to 68 per cent manganese, and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades. All grades are furnished in a lump size of 75 lb. x 2 in. and in a crushed size of 2 in. x down. If you wish further information, please write, wire, or phone the nearest Electromet office: in Birmingham, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

References

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The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, 0 cents; San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	6.81	7.17	8.37	6.42	—	6.41	7.42	11.17	6.47	6.47	7.70
Boston	6.91	7.36	8.54	6.52		6.42	7.43	11.18	6.56	6.76	7.98
Buffalo	6.80	6.65	8.41	6.21		6.00	6.95	11.07	6.08	6.30	7.67
Birmingham	6.80	6.65	7.70	6.80		6.80	8.65		6.95	6.10	8.65
Chicago	6.80	6.65	7.95	6.81		6.81	6.80	10.65	6.95	6.00	7.18
Cincinnati	6.98	6.67	8.21	6.09		6.08	7.11	11.02	6.37	6.42	7.55
Cleveland	6.80	6.65	8.00	6.00		6.80	6.80	10.75	6.28	6.47	7.51
Detroit	6.67 6.81	6.65 6.82	8.64	6.62 6.83	7.25-7.70	6.42	7.10	10.92-11.02	6.42	6.47	7.52
Houston	6.74		8.22	6.86		6.98			6.82	6.78	8.16
Jersey City, N.J.	6.85	7.27	8.47	6.75		6.50	7.78	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.15	9.60	6.75	11.20	6.60	8.60	12.65	6.60	6.65	8.90
Milwaukee	6.97	6.82	8.12	6.00		6.00	8.07	10.82	6.12	6.17	7.35
Moline, Ill.	6.10	7.00	8.35	6.10		6.18	7.16		6.30	6.30	
Newark, N.J.	6.62	7.41	8.63	6.72		6.70	7.71		6.70	6.78	7.18
New York	6.26	7.27	8.42	6.56		6.50	7.53	11.04	6.39	6.60	8.01
Norfolk, Va.	7.00					6.44	8.58		7.25	6.64	7.33
Philadelphia	6.11	7.11	8.30	6.45	8.30	6.42	7.45	10.75	6.17	6.24	7.36
Pittsburgh	6.80	6.65	8.00	7.04		6.81	6.80	10.65	6.95	6.95	7.18
Portland, Oreg.	7.80	9.05	10.00	7.60		7.35	9.65		7.30	7.30	9.25
Richmond, Va.	6.14	6.94	8.68	6.53		6.30	7.61		6.58	6.68	7.80
St. Louis	6.10	6.94	8.30	6.14		6.15	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.66	6.50		6.49	7.52		6.61	6.61	7.84
San Francisco	6.90	8.20	9.60	6.75		6.65	8.65	12.05	6.60	6.75	8.90
Seattle-Tacoma	7.35	9.01	9.70	7.85		7.15	9.62	11.90§	6.87	7.30	9.11
Spokane (cities)	7.80	9.40	10.70	7.65		7.10	9.20	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89		6.90	8.61		6.93	6.93	8.17

Prices do not include gage extras; † prices include gage and coating extras except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special for quality extra; § as rolled; †† as annealed. Base quantities: 2000 lb to 9999 lb except as noted. Cold-rolled strip: 2000 lb and over; cold-finished bars: 2000 lb and over; ** 500 to 1499 lb; †† 1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68%	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48%, nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48%, 2.8:1	$39.00-$42.00
48%, 3:1	41.00-45.00
48%, no ratio	30.00-32.00
South African, Transvaal	
44%, no ratio	$27.00-$28.00
48%, no ratio	34.00-35.00
Brazilian	
44%, 2.5:1, lump	nom.
Domestic	
(Rail nearest sellers)	
48%, 3:1	$39.00

Molybdenum

Sulphide concentrates, per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 24.75c per lb of contained Cr, c.l., packed 25.65c, ton lot 26.50c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr, 67-72%.) Contract, carload, lump, bulk, max. 0.01% C 37.00c per lb contained Cr; 0.01% C 36.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.50c, 2% C 32.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3%c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr, 62-66%, C 5-7%.) Contract, c.l. S.M.X.D. bulk, 26.25c per lb of contained Cr, C.l. packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S.M.X.D. 18.35c per lb of alloy, ton lot 19.25c, less ton lot 20.6c, delivered; spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-47%, C 0.06% max.) Contract carload, lump, 4" x down and 2" x down, bulk 25.7c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.9c per pound of contained chromium plus 12.6c per pound of contained silicon. F.o.b. plant, freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7.5%, C 0.05% max.) 25.7c per lb of contained silicon plus 16.1c per lb of contained silicon plus aluminum 37" x down, delivered.

Chromium Metal: (Min 97%, Cr and 1% Fe) Contract carload, 1" x D, packed, max 0.50% C grade, $1.12 per lb of contained chromium ton lot $1.14, less ton $1.16. Delivered. Spot, add 2c; prices on 0.10 per cent carbon grade up 4c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si packed 21.40c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.6c, less ton 17.1c. Delivered. Spot, add 0.4c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 13.6c, ton lot 16.7c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.1c, less ton 20.2c. Delivered. Spot, add 0.2c.

Silicon Metal: (Min 97% Si and 1% max Fe, C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.3c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.2c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N.Y., lump, carload, bulk, 9.00c per lb of alloy, ton lots packed 11.30c, 2c to 2½c lb 11.6c, smaller lots 12.1c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 9-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V, delivered. Spot, add 10c. **Crucible Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed. Spot, add 2c.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V oxide, freight allowed. Spot, add 2c.

BORON ALLOYS

Ferroboron: B 17.50% min, Si 1.00% max, Al 0.50% max, C 0.50% max. Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (16-18% B) $1.75c per pound; Grade B (14-16% B) $1.20; Grade C (12% min B) $1.50.

Borosil: (3 to 4% B, 10 to 14% Si), $0.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 14c per lb; smaller lots, 16c per lb.

Carbortam: (B 1 to 2%, contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N.Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%.) 10,000 lb W or more, $1.85 per lb of contained W; 2000 lb W to 10,000 lb W, $1.95; less than 2000 lb W, $2.07, f.o.b. Niagara Falls, N.Y.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N.Y., basis.

NOTE: Current prices on manganese, titanium and "other ferroalloys" appeared on page 147 Feb. 16 issue; calcium, zirconium, briquetted alloys and refractories, page 115, Jan. 26.

IRON AND STEEL SCRAP

Open market prices as reported to STEEL Feb. 26, 1963, gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 26	$42.00
Feb. 19	42.00
Jan. 1953	42.00
Feb., 1952	43.00
Feb., 1948	40.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Including brokers' commission)

No. 1 heavy melting	44.00
No. 2 heavy melting	44.00
No. 1 bundles	45.00
No. 2 bundles	44.00
No. 1 busheling	45.00
Machine shop turnings	31.00-31.50
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Cast iron borings	28.00-29.00
Cut structurals	43.00-44.00
Heavy turnings	44.00
Punchings & plate scrap	47.50
Electric furnace bundles	46.00

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-50.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00-44.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00
Rails, 2-ft and under	53.00
Rails, 18-in. and under	55.00
Rails, random lengths	49.00

Plus applicable freight absorption from other areas.

CLEVELAND

(Delivered consumer plant, including broker's commission)

No. 1 heavy melting	44.00-44.50
No. 2 heavy melting	43.00-43.50
No. 1 bundles	44.00-44.50
No. 2 bundles	43.00-43.50
No. 1 busheling	44.00-44.50
Machine shop turnings	31.00-32.00
Mixed borings, turnings	35.50-36.00
Short shovel turnings	35.50-36.00
Cast iron borings	35.50-36.00
Low phos	47.00-48.00
Alloy free short shovel turnings	37.00-38.00
Electric furnace bundles	46.00-46.50

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00-45.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
R.R. Malleable	46.00-51.00
Rails, 3-ft and under	51.00-52.00
Rails, 18-in. and under	52.00-54.00
Rails, random lengths	46.00-50.00
Cast steel	51.00-52.00
Railroad specialties	51.00-52.00
Uncut tires	51.00-52.00
Angles, splice bars	51.00-52.00
Rails, rerolling	53.00-54.00

Plus applicable freight absorption from other areas.

YOUNGSTOWN

(Delivered consumer plant, including broker's commission)

No. 1 heavy melting	45.00-45.50
No. 2 heavy melting	44.00-44.50
No. 1 bundles	45.00-45.50
No. 2 bundles	44.00-44.50
Machine shop turnings	32.00-33.00
Short shovel turnings	36.50-37.00
Cast iron borings	36.50-37.00
Low phos	48.00-49.00
Electric furnace bundles	47.00-47.50

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00

Plus applicable freight absorption from other districts.

NEW YORK

(Brokers' Buying Prices)

No. 2 heavy melting	35.00
Machine shop turnings	25.00
Mixed borings, turnings	29.00

Cast Iron Grades

No. 1 cupola	40.00
Unstripped motor blocks	32.00-33.00

PHILADELPHIA

No. 1 heavy melting	41.50
No. 2 heavy melting	41.50
No. 1 bundles	42.50
No. 2 bundles	41.50
No. 1 busheling	42.50
Machine shop turnings	32.50
Mixed borings, turnings	36.50
Short shovel turnings	36.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	45.00
Heavy breakable cast	47.50-48.00
Unstripped motor blocks	39.00
Drop broken machinery	52.00

CINCINNATI

No. 1 heavy melting	42.00
No. 2 heavy melting	42.00
No. 1 bundles	43.00
No. 2 bundles	42.00
No. 1 busheling	43.00
Machine shop turnings	33.00
Mixed borings, turnings	37.00
Short shovel turnings	37.00
Cast iron borings	37.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	49.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00
Brake shoes	41.00
Clean auto cast	52.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	45.00
Malleable	55.00
Rails, 18-in. and under	53.00
Rails, random lengths	47.00
Rails, rerolling	52.00

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	40.00-41.00
No. 2 bundles	37.00-39.00
No. 1 busheling	40.00-41.00
Machine shop turnings	26.50-27.00
Mixed borings, turnings	28.50-30.00
Short shovel turnings	28.50-30.00
Steel rips	34.00-36.00
Punchings & plate scrap	42.00-46.20

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	45.00
Unstripped motor blocks	35.00-37.50
Clean auto cast	50.00
Burnt cast	35.00-38.00
Drop broken machinery	52.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	42.50-43.00
No. 2 heavy melting	41.50-42.00
No. 2 bundles	41.00-42.00
No. 1 bundles	42.50-43.00
No. 1 busheling	42.50-43.00
Machine shop turnings	32.50-33.00
Mixed borings, turnings	36.50-37.00
Short shovel turnings	36.50-37.00
Low phos	48.50-49.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON

(Brokers' Buying Prices, f.o.b. shipping points)

No. 1 heavy melting	33.17
No. 2 heavy melting	33.17
No. 1 bundles	33.17
No. 2 bundles	33.17
Machine shop turnings	24.17
Mixed borings, turnings	22.17
Short shovel turnings	28.17
No. 1 cast	35.00-36.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	47.00-48.00

CHICAGO

(Including broker's commission)

No. 1 heavy melting	42.50
No. 2 heavy melting	42.50
No. 1 bundles	43.50
No. 2 bundles	40.50
No. 1 busheling	43.50
Machine shop turnings	30.50-32.50
Mixed borings, turnings	33.50-35.50
Short shovel turnings	33.50-35.50
Cast iron borings	33.50-35.50
Cut structurals	46.50
Heavy turnings	42.50
Electric furnace bundles	45.50

Cast Iron Grades

No. 1 cupola	42.00-44.00
Stove plate	40.00-42.00
Unstripped motor blocks	36.00-38.00
Clean auto cast	45.00-47.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt	45.50
R.R. Malleable	46.00-48.00
Rails, 2-ft and under	51.50
Rails, 18-in. and under	53.50
Angles, splice bars	50.00
Rails, rerolling	52.50

BIRMINGHAM

No. 1 heavy melting	38.00
No. 2 heavy melting	38.00
No. 1 bundles	39.00
No. 2 bundles	38.00
No. 2 busheling	35.00
Machine shop turnings	29.00
Mixed borings, turnings	33.00
Short shovel turnings	30.00-32.00
Cast iron borings	30.00-32.00
Cut structurals	42.00
Heavy turnings	38.00
Punchings & plate scrap	41.50
Electric furnace bundles	41.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	44.00-45.00
Charging box cast	39.00-40.00
Stove plate	42.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	41.00
Malleable	50.00
Rails, 3-ft and under	46.00
Rails, 18-in. and under	48.00
Rails, random lengths	40.00-41.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00
Rails, rerolling	48.00

ST. LOUIS

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
Machine shop turnings	30.00
Short shovel turnings	34.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	50.00
Rails, 3-ft and under	53.00-55.00
Rails, random lengths	49.00-51.00
Uncut tires	48.00
Angles, splice bars	49.00
Rails, rerolling	56.00-57.00

SEATTLE

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	33.00
No. 2 bundles	27.00
Machine shop turnings	24.41
Mixed borings, turnings	24.41
Short shovel turnings	24.41
Electric furnace, No. 1	40.41

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00

Railroad Scrap

Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	38.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	43.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00
Malleable	55.00
Rails, 3-ft and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	46.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	44.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Busheling	30.00
Busheling, new factory:	
Prepd	33.50
Unprepd	31.50
Short Steel Turnings	32.50

Cast Iron Grades†

No. 1 Machinery Cast	50.00

†F.o.b., shipping point.

OLD CEILING BASE PRICES

Basing-point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$42.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	38.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	38.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	44.00	46.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00

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See that weave? The sisal is cut *on the bias.* Every fiber is directed *toward* the cutting edge. There's no danger of whole strands flying off at high speed. Every Bias Sisalweev wears *evenly* and outlasts any other design.

You'll find a Bias Sisalweev ideal for heavy cutting down of drawn, stamped, or cast ferrous and non-ferrous articles. You can use it at high or low speeds—it's impossible to scorch at any speed or pressure. And, it's ventilated —24 air channels give extra cooling.

Bias Sisalweev is supplied either treated or untreated, but we recommend the exclusive H-VW-M HC, (heavy cut) treatment. This not only increases the rate of cut, but lengthens wear life and power to hold composition. And for buffing steel, you can't beat the combination of a Bias Sisalweev and H-VW-M 6-B-97 composition for heavy cut or 6-B-66 for medium cut with finer finish.

Bias Sisalweev is just one of many results of over eighty years of constant electro-plating and polishing development — a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer not only in brushes and buffs—but in every phase of plating and polishing.

PLATEMANSHIP

Further information on Bias Sisalweev is available on request.

Your H-VW-M combination — of the most modern testing and development laboratory — of over 80 years experience in every phase of plating and polishing — of a complete equipment, process and supply line for every need.

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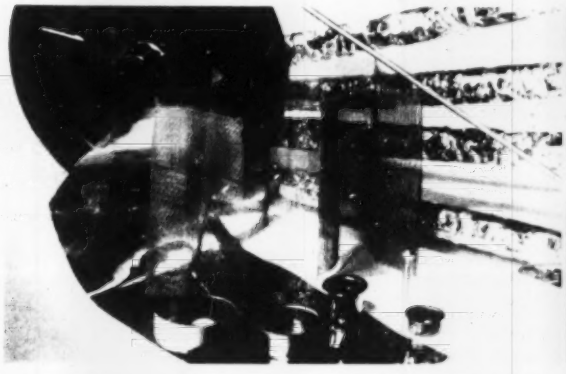
The Metal Market



Zirconium and Gallium—Atomic Power Plants May Find New Uses for Them

Since it does not absorb neutrons, zirconium metal may hold the key to structures for atomic power plants

Liquid metals for heat transfer are being studied on many fronts. Gallium metal is liquid at room temperature

The lifting of price controls on aluminum, copper, brass and wire mill products took no one by surprise. The aluminum market is steady, but other quotations rise

WIPE-OUT OF ALL price controls on copper, aluminum, brass and wire mill products and a number of related products found industry ready and waiting.

New copper price lists in preparation for weeks were issued almost simultaneously with the OPS order. Aluminum producers expect to hold the price line on most major products, though minor adjustments on some items will be made.

Out the Window Immediate increases in primary copper ranged from 3 to 4 cents for domestic metal. Custom smelters set selling prices tentatively in the 32 to 36-cent bracket, on the basis of present scrap prices. Brass mill products advanced on the basis of primary copper cost increases plus about 2 cents a pound in higher operating costs not heretofore included in selling costs, and a reverse adjustment for lower zinc prices.

Specifically included in the decontrol order are aluminum mill products, including foil, powder and paste; brass mill products; copper wire mill products; copper powder; bauxite; alumina; copper ore; copper and aluminum cloth and screen; and a variety of screw machine products.

Exit Entitlements With the passing of the multiple price system goes the distinction between foreign entitlements and domestic allocations. Consumers will be on their own in lining up supplies wherever they can. Lake copper is not quoted on the market under new prices as yet; most of it goes into stockpile under DMPA purchase agreement.

Brass mills' new listings are based on 31.1 cent copper and 12.58 cent zinc. Chase Brass & Copper Co. was first out with partial new quotations. Yellow brass sheet moved up from 40.17 to 42.05 cents, wire from 40.46 to 42.31, tube from 43.18 to 45.01. Red brass sheets are up correspondingly. Kennecott Wire & Cable Co. posted new base prices effective Feb. 26, as shown in the table on the following page.

Bulls and Bears Custom smelters will lead the way in copper pricing, according to trade consensus. Most custom outfits withdrew from scrap buying temporarily last week after No. 1 copper soared to quotations around 29.25 cents a pound, up 7 cents since decontrol. Signs are that users of scrap are now in a position to pressure prices into more reasonable categories.

Free Flight After a lot of fancy figuring, brass mills and ingot makers posted buying prices for scrap. They are listed on the following page, as are current refiners' buying prices. Dealers' buying prices for scrap are now listed instead of ceilings.

Brass ingot makers have put new price tags on their goods too. Increases range from 0.5-cent to 4.46 cents a point. Here's the breakdown for major grades: No. 115 moved from 27.25 to 29.50, No. 215 from 40.00 to 41.75, No. 205 from 33.00 to 35.00, and No. 405 from 23.25 to 24.00. Foundry business being what it is today, the ingot industry may be hard put to maintain these levels. January delivery of ingot brass and bronze increased 6 per cent from the previous month, but the total of 24,123 tons shipped was 16 per cent behind January, 1952.

Present plight of the metals scrap dealer is summed up thusly by a statistician's pencil: No. 1 copper scrap has skyrocketed 7.75 cents in the past two weeks. Any dealer holding 100 tons of that grade would make a paper profit of $15,500 because of decontrol alone! Who calls them poor peddlers?

Tin Production Climbs

World tin production outstripped consumption again last year, according to figures compiled by the International Tin Study Group. Mine products rose 3 per cent to 172,500 tons; metal production of 167,400 tons remains at the previous year's level. World consumption slumped from 137,000 tons in 1951 to 128,000 tons in 1952.

Lead Imports Double

Imports of lead in 1952 more than doubled the previous year's mark and set an all-time tonnage record. The year's total hit 637,307 tons. About 85,000 tons of the increase stemmed from U. S. stockpile buying from the British Ministry of Supply. Current lead markets weakened temporarily as quantities of foreign lead are available in the eastern seaboard at 0.75-cent below domestic quotations. Shutting down of two smelters in the next month will cut down available supplies considerably.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 27.00-28.00. Conn. Valley, Lake 24.62½c, nom., delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00; 80-10-10 (No. 210) 31.00; 88-10-2 (No. 305) 41.00; 70-30 (No. 2684) 34.00; 65-35 (No. 280 yellow) 30.00; 72-28 (No. 405) 34.00.

Zinc: Prime western 11.25c; brass special 11.50; intermediate 11.75c; East St. Louis, high grade 12.00c and special high grade 12.25c, delivered.

Lead: Common 13.30c; chemical 13.40c; corroding, 13.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c; pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c nom.; No. 12 foundry alloy (No. 2 grade) 22.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.00c; grade 2, 21.50c; grade 3, 21.25c; grade 4, 21.00c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over, arsenic 0.05% max., other impurities 0.1% max., 33.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.62c; "XX" nickel shot, 63.62c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $290-$296 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $6 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952, ceilings lifted Feb. 26, 1953, but no new prices yet listed)

Sheet: Copper 35.02; yellow brass 42.06; commercial bronze, 90% 45.15; 95% 44.38; red brass, 80% 41.92, 80% 42.24; best quality, 41.35; nickel silver, 18% 56.08; phosphor-bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting 33.80; commercial bronze 90% 44.84, 80% 44.07; red brass 85% 42.79, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.01; commercial bronze, 90% 47.04; red brass, 85% 46.01.

Wire: Yellow brass 42.34; commercial bronze 95% 45.44, 90% 44.67; red brass, 85% 42.39, 80% 42.63; best quality brass 41.64. (Base prices effective Feb. 26, 1953).

Copper Wire: Bare, soft, f.o.b. eastern mills, 10,000 lb lots 35.14, 30,000 lb lots 35.27, 1 ton 35.77. Weatherproof, 10,000 lb 35.51, 30,000 lb 35.66, 1 ton 36.10. Magnet wire, 1,000 lb or more 41.85, less 42.60.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

*Lengths 72 to 180 inches. †Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.0188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $18.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.50 per cwt. Traps and bends: List prices plus 42½%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.25-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill effective Feb. 13, 1953) Sheets: cold-rolled 83.00c; strip, cold-rolled 89.00c. Rods and shapes, 75.00c. Plates 81.00c. Seamless tubes 112.00c.

MONEL

(Base prices f.o.b. mill effective Feb. 13, 1953) Sheets, cold-rolled 66.50c. Strip, cold-rolled 69.50c. Rods and shapes, 61.50c. Plates, 63.50c. Seamless tubes, 76.50c. Shot and blocks, 54.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 25-26	27.50-28.00	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 24	24.00	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.60	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 7-10	24.50	14.30	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. 1948 Avg.	21.50	14.825	12.00	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951. Ceilings on prices were lifted Feb. 13 but no prices have been posted.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	...	...	...
Yellow Brass	21.25	21.00	20.00
Commercial Bronze			
90%	20.62½	22.37½	21.87½
95%	22.62½	22.37½	21.87½
Red Brass			
85%	22.25	22.00	21.50
Best Quality (71-80%)	22.00	...	...
Muntz metal	20.25	20.00	19.50
Nickel silver, 10%	23.62½	23.37½	12.87½
Phos. Bronze, A	...	...	...
Naval Brass	20.62½	20.37½	19.87½
Manganese Bronze	20.62½	20.37½	19.87½

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 27.00; No. 2 copper 25.00; light copper 25.00; refinery brass (60%, copper) per dry copper content 24.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.00 nom.; No. 2 23.00 nom.; light copper 21.00 nom.; No. 1 composition red brass 19.00 nom.; No. 1 composition turnings 18.50 nom.; mixed brass turnings 13.50 nom.; new brass clippings 17.00-17.50; No. 1 brass rod turnings 15.00-15.50; light brass 12.50 nom.; heavy yellow brass 14.50 nom.; new brass rod ends 15.50-16.00; auto radiators, unsweated 15.00 nom.; cocks and faucets 16.50 nom.; brass pipe 17.50 nom.

Aluminum: Clippings 28, 14.00 nom.; old sheets 16.00 nom.; crankcase 16.00 nom.; borings and turnings 8.00 nom.; pistons and struts 6.50 nom.

Tin: No. 1 pewter 70.00; block tin pipe 100.00; No. 1 babbitt 60.00.

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 10.25-10.50; mixed babbitt 13.75-14.00.

Zinc: old zinc 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00.

Nickel: Sheets and clips 55.00 nom.; rolled anodes 55.00 nom.; turnings 55.00 nom.; rod ends 55.00 nom.

Monel: Clippings 33.00 nom.; old sheet 30.00 nom.; turnings 25.00 nom.; rods 33.00 nom.

Steel Bars . . .

Bar Prices, Page 155

Boston Demand for quality hot-topped bars is heavy, notably in the large sizes with the shell steel program limiting commercial tonnage.

New York Hot carbon bars are in tight supply, especially rounds from 1½ inches up, and small flats. Sellers generally have all the rated work they can roll over the remainder of this half. This, it is said, even applies to small rounds, despite somewhat less consuming pressure.

Philadelphia Hot carbon bar inquiry is well sustained. While there is not too strong a demand for small rounds, most sellers anticipate they will have no difficulty operating at a high rate throughout remainder of first half on rated tonnage.

Pittsburgh With plenty of CMP tickets casting about for a place to rest, there won't be much open-end products available from hot-rolled bar producers, at least until after end of second quarter.

Cleveland With pressure for shell steel unabated there is little prospect for any easing in supplies of large size bars for months to come. Consequently, open-ending of the Controlled Materials Plan will mean little to consumers.

Sheets, Strip . . .

Sheet and Strip Prices, Page 155 & 156

Cleveland Little, if any, so-called "free" tonnage is expected to develop in the light, flat-rolled steel market over the next several months. Indications are second quarter ticket holders will have difficulty placing all of their authorizations. Consequently, expectations are mill output will be taken up on allocations. Any "free" tonnage that does arise is likely to be disposed of to regular customers of the mills. Open-ending of the Controlled Materials Plan has resulted in a flood of requests for additional tonnage but few of these stand much chance of getting attention.

Boston Full impact of return of steel distribution to industry, while not expected until third quarter, may well develop the trends in several flat-rolled specialties with longer lead time by second quarter. Included are silicon sheets, alloys, enameling stock and others usually scheduled well ahead of carbon grades.

New York While various consumers are sounding out hot and cold sheets sellers on availability of non-rated tonnage now that allotments have been open-ended, they have received little encouragement as to obtaining such tonnage before third quarter. Producers generally have more rated work in prospect for remainder of this half than they can handle. This is also true with regard to electrical sheets, enameling stock and most other specialties.

Pittsburgh Until tickets for steel sheets are all cashed, there won't be much chance of getting any free tonnage under relaxed CMP open-ending.

St. Louis Galvanized sheet demand from farms is easing off, but producers believe it seasonal. They

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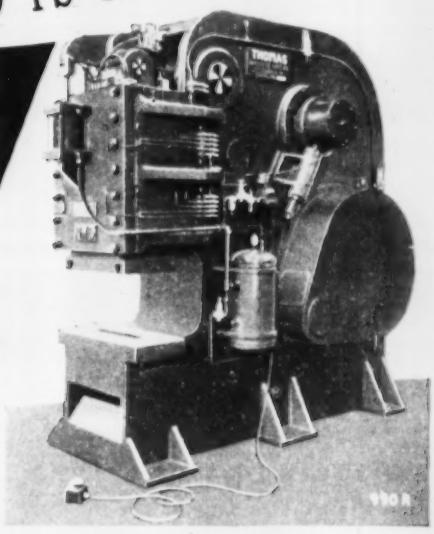

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28

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

Group of RUEMELIN Fume Collectors Keeps Shop Clear of Welding Fumes

This well ventilated welding department is typical of hundreds of similar installations. Welding operators appreciate smoke and gas-free atmosphere. Thousands in service. Many repeat orders. Collecting fumes at the source with local exhaust hoods has proven most practical in operation. It is particularly helpful in winter months when doors and windows are closed. Write for Bulletin 37-D describing all types of Ruemelin Fume Collectors.

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are apprehensive over future demand consequences of the drought in southern markets. Pressure for sheets from farm machinery makers, however, is unabated. Although mills here supply relatively little automobile steel, they are watching the motor industry closely for clews to their own future. District sheet production is to decline the last half of July and early August due to interruptions for plant improvement.

Chicago Steelmakers here see no chance whatever of there being any free distribution of sheets, either hot or cold-rolled, during the first half.

Birmingham "Open-ending" of steel distribution has meant little here in the matter of demand for steel sheets unless it be to slightly intensify pressure.

Plates . . .

Plate Prices, Page 155

Pittsburgh The plate market is easier though supply continues tight. There is plenty of evidence users are shopping around before they make commitments. Excess prime plates, which heretofore have found a ready market among customers who would rather buy this material on a grab-bag basis before going into the premium price field, are not in such ready demand.

Boston Wide and heavier gage clad plate mills have little open tonnage for second quarter, but strip mill plate tonnage is in increasing supply. Nickel-bearing clad plate shipments have improved to 4 months with straight chromium stainless ranging from 8 to 10 weeks.

New York While there is not quite the pressure that existed a few weeks ago, plate producers still have more rated work ahead of them in second half than they can handle.

Philadelphia Plate flange work deliveries are a little easier, ranging 8 to 12 weeks, depending upon types of heads.

Seattle Increased demand for plates is reported. Classified projects at Hanford involve sizable tonnages, while both public works and private construction in this area are showing increased activity.

Tubular Goods . . .

Tubular Goods Prices, Page 159

Pittsburgh While hope was raised by stories about the current freight rate battle between western railroads and trucklines resulting in as much as a 40 per cent cut by railroads, there is no indication of much easing in oil country pipe supply. First, these rail and truck lines are affected by pipeline plans that are still on the drawing board. Second, PAD has already allocated material for the 2nd, 3rd and 4th quarters and these allocations are expected to hold. Undoubtedly some western pipe lines will be affected.

Boston Direct shipments on merchant pipe are filled through second quarter. Only when distributors turn down full allotments of buttweld are there openings in schedules for direct shipments.

New York Merchant pipe jobbers are ordering more actively in anticipation of a spring pick-up in building. In a few isolated instances, particularly as it applies to buttweld, there has been re-selling of carlots through jobbers to other jobbers or to exporters at a discount.

Philadelphia The Claymont, Del., mill will resume operations in its pipe division Mar. 9, after suspension of about a month.

Structural Shapes . . .

Structural Shape Prices, Page 155

Philadelphia Bids were closed last week on two sizable commercial projects, one a 2800-ton refrigerator assembly building for the Rex Mfg. Co., Connersville, Ind., subsidiary of the Philco Corp., Philadelphia, and the other a 700-ton factory building for Heilig Bros., York, Pa. Meanwhile, various bridge jobs are pending. Phoenix Iron & Steel Co. is reducing its base on standard shapes from 6.10c to 4.95c, as noted in last week's issue.

Boston Sharper competition is reflected in fabricated structural steel prices. Delivery is an increasing factor in private building contracts. Plain material supply is improving, district shops and warehouses filling needs in wanted sizes with foreign steel. European rolled structurals are around 4.75c, Boston, net, standard sizes, with bar angles, 4.66c. One premium price mill reduced structurals $23 per ton to 4.95c m'l. This is still too high for most shops paying 3.90c, eastern mill.

New York Bridge work is outstanding, with the Bethlehem Steel Co., Bethlehem, Pa., low on a 9000 ton state bridge over the Raritan river in New Jersey and with plans expected out in two or three weeks on the main portion of the New York state thruway bridge over the Hudson river off Rockland county, involving more than 10,000 tons.

Conversion Steel . . .

Chicago Lifting of production controls on automobiles has given steel conversion deals a shot in the arm. Until recently it had been figured this market would fade out by midyear. New commitments are being made for third quarter. Inland Steel Co., leading figure in conversion in this area with finishing capacity exceeding ingot capacity, has booked conversion of slabs to hot-rolled sheets in the July-September period. It is all for automotive account.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 155

Boston Suppliers of concrete reinforcing bars have substantial order backlogs. Housing projects account for approximately 6000 tons placed, but currently there is a lull in estimating pending improvement in bridge requirements. Engineering bottleneck limits shipments to jobs in numerous cases.

Seattle Rolling mill operations are at capacity. Demand continues strong and estimating forces are busy. Major installations in Alaska are up for figures and placements are expected soon. Industrial construction involves substantial tonnages of reinforcing bars.

ATLANTA, Ga., Alpine 4885
Morrison Drabner Steel Co., Inc.

BALTIMORE, Md., Peabody 7300
Hill Chase Steel Company of Maryland
Asheboro, N.C.: Phone 8849
Richmond, Va.: Phone 7-4573

BEAUMONT, Tex., Phone 4-2641
Standard Brass & Mfg. Co.

CHICAGO METROPOLITAN AREA
Kathumel Steel & Aluminum Company
Evanston, Ill.: Ambassador 2-6700

CINCINNATI, Ohio, Wabash 4480, 4481
Morrison Drabner Steel Co., Inc.

CLEVELAND, Ohio
Nottingham Steel Company
Atlantic 1-5100
Copper & Brass Sales, Inc.
Endicott 1-6757

DALLAS, Tex.
Delta Metals, Inc.
Hunter 7446
Earle M. Jorgensen Co.
Riverside 1761

DAVENPORT, Iowa, Phone 3-1895
Nichols Wire & Aluminum Co.

DETROIT, Mich.
Copper & Brass Sales, Inc.
Larum 7-3380

HONOLULU, T. H., Phone 5-2541
Permanente Cement Co.

HOUSTON, Tex.
Standard Brass & Mfg. Co.
Preston 1123
Earle M. Jorgensen Co.
Orchard 1621

INDIANAPOLIS, Ind.
F. H. Langsenkamp Company
Imperial 4321
Kathumel Steel & Aluminum Company
Franklin 5361

KANSAS CITY, Mo., Victor 1041
Industrial Metals, Inc.

LOS ANGELES, Calif.
Eureka Metals Supply Company
Mutual 7286
Earle M. Jorgensen Co.
Lucas 0281
Reliance Steel Company
Adams 3-3193

MILWAUKEE, Wis., Evergreen 4-6000
Kathumel Steel & Aluminum Corp. of Wisconsin

MINNEAPOLIS, Minn.,
Kathumel Steel & Aluminum Company
Gladstone 5943, Prior 4030

NEW ORLEANS, La.
Orleans Steel Products Co., Inc.
Raymond 2116
Standard Brass & Mfg. Co.
Aud. 1353

NEW YORK METROPOLITAN AREA
A. R. Purdy Co., Inc.
Lyndhurst: Rutherford 2-8100
New York: Chelsea 3-4455
Newark: Humboldt 2-5566

OAKLAND, Calif.
Gilmore Steel & Supply Company
Glencourt 1-1680
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Eagle Metals Inc. of Oregon

SAN FRANCISCO, Calif., Klondike 2-0511
Gilmore Steel & Supply Company

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SHREVEPORT, La., Phone 2-9483
Standard Brass & Mfg. Co.

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ST. LOUIS, Mo., Lucas 0051-2-3
Industrial Metals, Inc.

SYRACUSE, N. Y., Enterprise 6400
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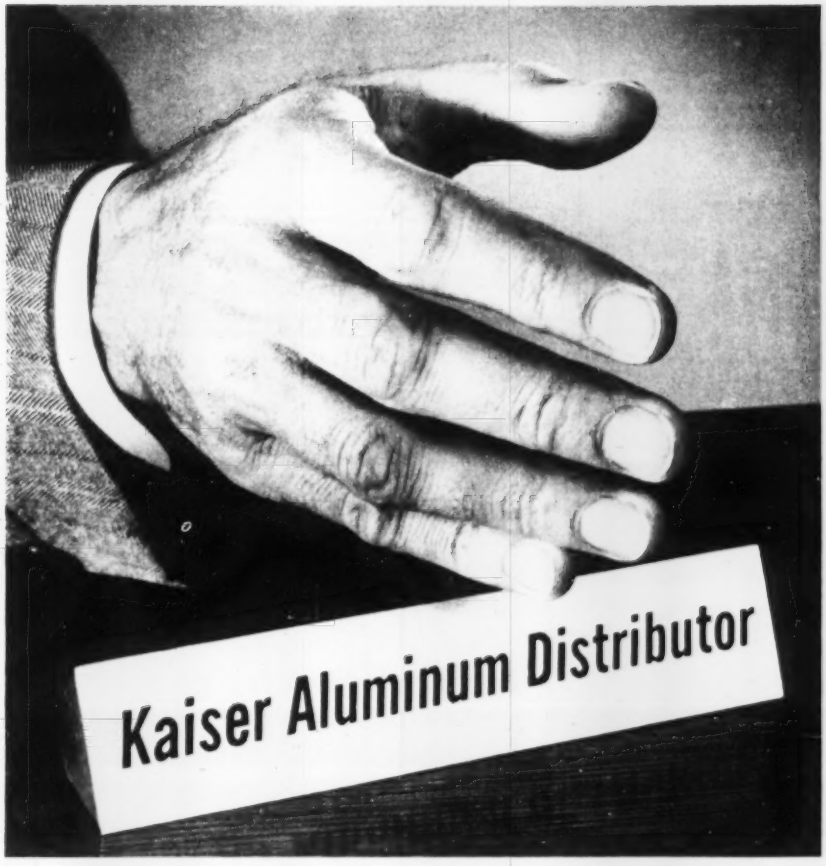

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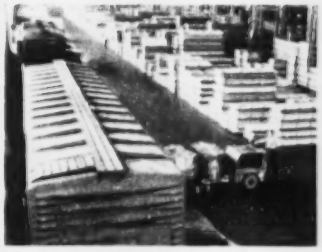

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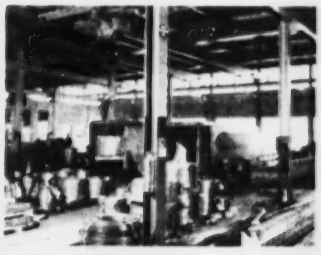

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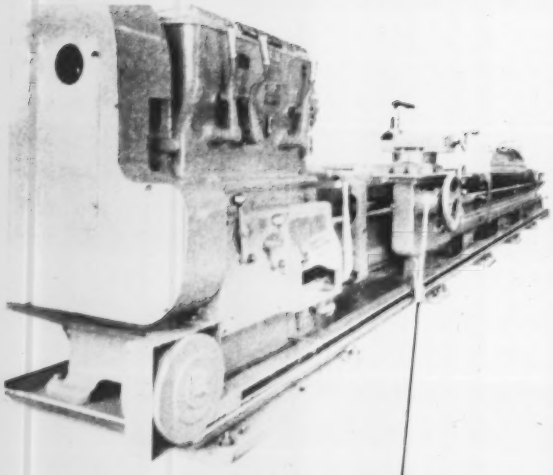
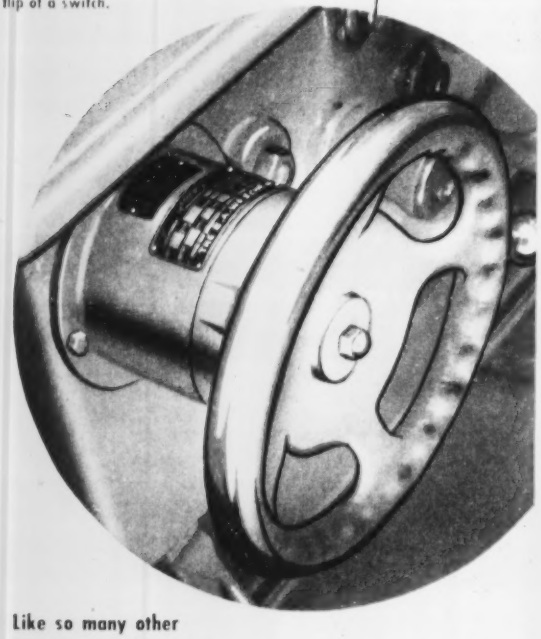


This is a 36" Series F heavy duty engine lathe, one of the fine precision machines produced by The Nebel Machine Tool Company of Cincinnati. A feature of this long bedded beauty is the power operated Rapid Traverse which moves the heavy apron quickly and surely in either direction at the flip of a switch.



Like so many other builders of fine machine tools Nebel called on Wesche to design and produce the torque motor that puts the power on the spot where the power is needed. Specifications called for ½ h.p., 3 phase, 60 cycle, 220/440 volt with a special mounting and special winding to provide the exact torque required.

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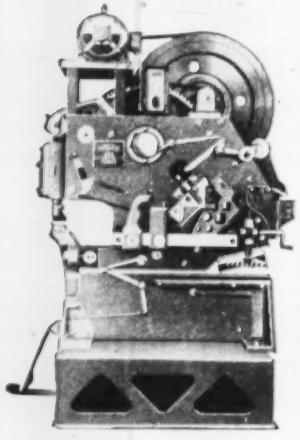

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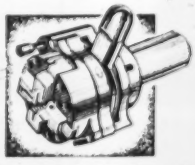

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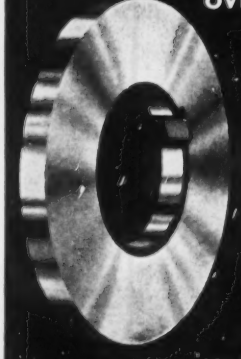

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Wire . . .

Wire Prices, Page 157

New York India Supply Mission, Washington, is buying 2000 long tons of galvanized wire in coils, bids closing Mar. 13. Included are 1250 tons of No. 16 gage, balance No. 14 gage, commercial quality, soft.

Boston While on some wire products the mills are scheduled well into June, there are openings on others for May and June.

Birmingham Most wire products are in considerably better supply currently.

Iron Ore . . .

Iron Ore Prices, Page 161

Cleveland With an early opening of navigation on the lakes anticipated, all fear of an iron ore shortage this spring has vanished.

Ore consumption in January totaled 8,292,585 gross tons, according to the Lake Superior Iron Ore Association. This was a slight increase compared with consumption of 8,219,924 tons in December, but was 765,203 tons greater than the 7,527,382 tons consumed in January, 1952. Only nine blast furnaces out of 202 in the U. S. and Canada using Lake Superior ore were idle on Feb. 1. A year ago 7 were idle out of a total 195 stacks.

Total stocks of ore on Lake Erie docks and at furnaces on Feb. 1 were 37,076,604 gross tons. This compares with 45,171,753 tons on Jan. 1, and with 35,927,110 tons on Feb. 1, 1952.

Pig Iron . . .

Pig Iron Prices, Page 154

New York Blast furnace output of pig iron and ferroalloys set a record in January at 6,564,383 net tons, according to the American Iron & Steel Institute. This exceeded the previous record, made in October, by 49,292 tons. It was nearly 55,000 tons larger than in December and almost 525,000 tons above output in January, 1952. The production in January was 97.3 per cent of capacity, rated at 79,380,000 tons.

Output of pig iron in January amounted to 6,482,081 tons and ferroalloys 82,302 tons.

Philadelphia Approximately 1200 tons of Spanish bessemer iron arrived here last week for a district mill. Little foreign iron otherwise is being received here.

Pittsburgh Blowing out of the No. 7 furnace at the Edgar Thomson Works occurred Feb. 20, but no great hardship is expected to result in the Pittsburgh district pig iron market. Foundry activity is continuing at a slow rate.

Cleveland While demand pressure on merchant iron sellers has slackened they continue to dispose of all their output without too much difficulty. Orders are being solicited more actively than for a long time past, however, with foundry operations continuing spotty.

Chicago Demand for foundry pig iron is holding strong. There is enough to go around but most consumers would take more if they could get it. More iron is preferred to scrap now being used but melters don't want the iron had enough to take out-of-the-district offerings at premium prices. New orders for castings continue upward.

St. Louis Granite City Steel Co. blast furnaces will shift 50 per cent to foundry iron throughout March. Demand is so low sporadic production will supply it. Basic iron inventories are comfortable but the company's allocations to customers probably will remain unchanged for third quarter. Final decision depends on second quarter carryover.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 159

Chicago Coke market here retains its recently acquired renewed vigor. Gray iron foundries discovered they had allowed inventories to get too low and with heavier melting schedules in sight, sought to fill their bins. No shortage of foundry coke seems likely to develop but the present surge is straining supply temporarily.

Scrap . . .

Scrap Prices, Page 162

Philadelphia Steel scrap grades continue at the equivalent of the old OPS price ceilings, pending completion of contracts and development of new buying of representative character. While there have been unconfirmed reports of some buying for Morrisville, Pa., of No. 1 steel at low phos premiums, the general disposition is to keep prices as steady as possible during the present period of adjustment. Weakness is indicated in No. 2 bundles, but there has been no new buying to test the market. All leading cast grades are now on a delivered basis, with charging box cast easier at $45, compared with $45 to $46 recently. Heavy breakable cast, on a delivered basis, may now be quoted at $47.50 to $48.

Pittsburgh No exciting developments are apparent in the Pittsburgh district scrap market, nor are they expected until about March 1. Only movement is on old orders at the former ceiling prices. With sizable mill inventories and equally good scrap yard stocks, both sides are waiting.

New York Brokers' buying prices for steel scrap continue unchanged but some changes are expected once the market adjusts itself to the normal rules of supply and demand. Brokers are paying the same for cast grades as heretofore.

Cleveland The scrap market in this area is more or less marking time pending development of a definite trend. Material is moving to the mills on old orders at the former ceiling prices, but little new buying is reported. Quality grades of steelmaking scrap and electric furnace material are reported strong, and it would not surprise anyone if prices on such material advanced.

Chicago For the most part scrap prices are holding unchanged. An exception is No. 2 dealer bundles, off $2 per ton from the former ceiling to $40.50. Other steelmaking grades bring ceiling prices on going business although volume has slowed up. Blast

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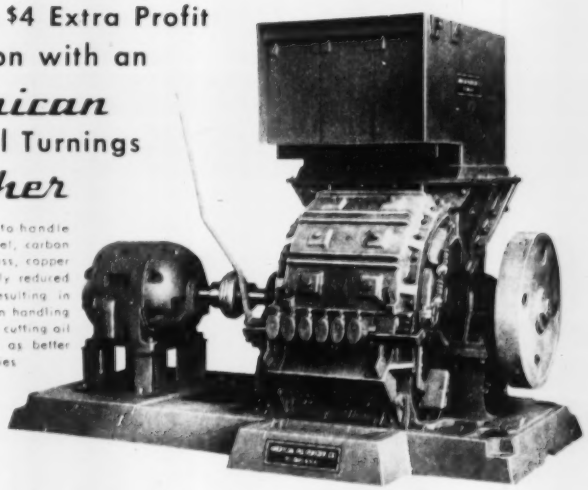

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furnace items are not moving well with price weakness continuing. Cast grades are too abundant to be sensitive pricewise to improvement in foundry operations.

Buffalo Although strength dominates the scrap market an air of uncertainty prevails as dealers wait for mills to announce prices on shipments for next month. Steelmaking grades continue to move at old ceiling levels.

St. Louis Scrap market since decontrol has been marking time pricewise awaiting completion of old orders, on which ceiling prices continue to apply by mill-dealer agreement. Soon after Mar. 1, quotations on No. 2 steel and No. 2 bundles are expected to ease off, especially the latter. Both are in fairly good supply and mills are reported talking the price down. Next month numerous orders expire, although some longer term ones will carry over into second quarter. Rails continue in tight supply. Rerolling mills are refusing to pay more than $50 plus switching charges, with the result dealers are buying them for speculative stockpiling, some as high as $53 to $54. Scrap shipments are increasing in response to price softness and open weather.

Birmingham Removal of price controls has had little effect on the scrap market here. Generally, former ceiling prices still apply.

San Francisco Steel scrap prices are down to the lowest levels in months. Differentials with other districts which had existed prior to the postings of OPS ceilings now are about re-established. The market levels, however, appear to be in for a testing period. Consumers hope the newest price reductions will not have a fading effect on deliveries and they are watching the situation closely. But for the time being inventories are comfortable despite capacity consumption. No. 1 cupola cast prices continue to be shaded. One of the largest consumers here reported it purchased a shipment at $37.50 a ton, delivered.

Seattle Decontrol has had little effect on the scrap market as surplus offerings had weakened prices before the government's suspension order. No. 2 heavy melting is generally quoted at $28.41, bundles $26.41. The largest purchaser here now has a 2-month inventory.

Rails, Cars . . .

Track Material Prices, Page 157

San Francisco Western Pacific railroad will purchase prefabricated underframes for 102 flat cars from outside manufacturers, but will assemble the cars in the company's main shops in Sacramento, Calif.

Warehouse . . .

Warehouse Prices, Page 161

Cleveland Warehouse operators do not anticipate much change in supply conditions before third quarter despite the open-ending of the Controlled Materials Plan. With the mills pretty fully committed through second quarter on hard-to-get products they see little prospect of much so-called "free" steel over the remainder of the first half.

Boston Distributors are improving their inventories on specialties and lighter sizes of more critical items. Cold-rolled sheet buying is heavy in all gages.

Philadelphia The trend in warehouse business is mixed. Some distributors reported February daily rate of business was slightly higher than that for January, while others said their daily volume was off. All agree February business volume was satisfactory, and that they could have sold more if their inventories had been in better balance.

Pittsburgh Demand for warehouse steel in the Pittsburgh district is slightly off, and there is less inclination to accept size and quality substitutes than was the case six months ago. Inventories are better balanced.

Canada . . .

Toronto, Ont. Production of primary iron and steel shapes in Canada in November, amounted to 388,331 net tons of which 371,774 tons were carbon and 16,557 tons alloy steel shapes. October production amounted to 410,405 net tons including 398,869 tons of carbon and 13,536 tons of alloy steel shapes and for November, 1951 production amounted to 421,911 net tons.

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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, state thruway bridges, Montgomery county, N. Y., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through B. Perini & Sons, Inc., Framingham, Mass., general contractor.

800 tons, industrial building, Simplex Wire & Cable Co., Newington, N. H., to Hartman Structural Steel Co., Holyoke, Mass.; in addition to 625 tons previously reported going to Bancroft & Martin Rolling Mills Co., Portland, Me.

200 tons, post office building, New Haven, Conn., to Grosser & Shlager Iron Works, Somerville, Mass., through Peerless Construction Co., Boston.

STRUCTURAL STEEL PENDING

10,000 tons, main portion of New York state thruway bridge over Hudson river, off Rockland county; plans expected out around Mar. 15; as noted in a previous issue, 9000 tons of approach work have been let to American Bridge Division, United States Steel Corp., Pittsburgh.

9000 tons, state bridge over the Raritan river, New Jersey, Bethlehem Steel Co., Bethlehem, Pa., low bidder.

4000 tons, state hospital addition, in Kings county, New York; opening of bids had been postponed until Feb. 26; the addition is designated as a basic science building.

2800 tons, refrigerator assembly building, Rex Mfg. Co., Connersville, Ind.; subsidiary of the Philco Corp., Philadelphia; bids closed Feb. 25.

2400 tons, Washington state Chehalis river bridge, double leaf bascule and girder approaches; bids to Olympia Mar. 24.

700 tons, factory building, Heilig Bros., York, Pa.; bids closed Feb. 26.

300 tons, two school buildings, Taunton, Mass.

300 tons, three shops at air fields, Alaska area; bids in to U. S. Engineer.

125 tons, 2-span continuous rolled beam bridge over New Haven railroad, Georgetown, Conn.; bids Mar. 16, Hartford, Conn.

120 tons, span rolled beam bridge, Union, Conn.; bids Mar. 16, Hartford, Conn.

Unstated, also reinforcing, exhibition building for Pacific National Exhibition, Vancouver, B. C.; general contract to Commonwealth Construction Co., Vancouver, $1,188,126.

Unstated, intake gates, operating machinery, etc., Chief Joseph dam; bids to U. S. Engineer, Seattle, Mar. 2.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, East Boston Terminal, Boston, to Concrete Steel Co., Boston, through Raymond Concrete Pile Co., Boston, general contractor.

165 tons, administration building, Ft. Richardson, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle. Brezina Construction Co., general contractor.

REINFORCING BARS PENDING

700 tons, Washington state Chehalis river bridge; bids to Olympia, Mar. 24.

100 tons, American Biscuit & Cracker Co. plant, Tacoma, Wash.; general contract to George E. Teufel Co., Seattle.

Unstated, family quarters, Elmendorf Air Base, Alaska; L. E. Baldwin, Inc., Seattle, low $2,556,500.

Unstated, 2-story addition to headquarters building, Ft. Richardson, Alaska; bids to U. S. Engineer, Anchorage, Alaska, Mar. 17.

Unstated, ammunition shop, Ft. Richardson, Alaska; bids to U. S. Engineer, Anchorage, Mar. 20.

PLATES . . .

PLATES PENDING

500 tons, million-gallon elevated water tank, Richmond Highlands, Chicago Bridge & Iron Co., Seattle, low $142,830, to city of Seattle.

Unstated, 150,000-gallon storage tank, also 10- to 12-inch water mains, McChord Air Field, Washington state; bids soon to U. S. Engineer, Seattle.

Unstated, two 50,000-gallon storage tanks, Hanford Works; bids to AEC, Richland, Wash.

PIPE . . .

STEEL PIPE PLACED

7000 tons, 11-inch, piling, pier No. 1, East Boston Terminal, Boston; 3500 tons to Jones & Laughlin Steel Corp., Pittsburgh, 2000 tons to A. O. Smith Corp., Milwaukee, and 1500 tons to Youngstown Sheet & Tube Co., Youngstown; placed by Raymond Concrete Pile Co., Boston, general contractor.

CAST IRON PIPE PENDING

100 tons, 8-inch mains, class 150, bids in at Port Angeles, Wash., Feb. 19; disp.; alternatives.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atchison, Topeka & Santa Fe, 97 diesel units to various manufacturers.

Chesapeake & Ohio, 67 diesel units awarded as follows: Electro-Motive Division, General Motors Corp., La Grange, Ill., forty-five 1500-hp road-switchers and four 2250-hp passenger units; American Locomotive-General Electric Companies, Schenectady, N. Y., sixteen 1000-hp road-switchers; and Baldwin-Lima-Hamilton Corp., Eddystone, Pa., two 1600-hp road-switchers.

Chicago & Northwestern, 101 diesel units awarded as follows: Electro-Motive Division, General Motors Corp., La Grange, Ill., eleven 2250-hp passenger units, forty 1500-hp road switchers, and four 1200-hp and twelve 600-hp switchers; American Locomotive-General Electric Companies, Schenectady, N. Y., five 1000-hp road-switchers and ten 1500-hp road-switchers; Fairbanks-Morse & Co., Chicago, eleven 1600-hp road-switchers and three 1200-hp road-switchers; and Baldwin-Lima-Hamilton Corp., Eddystone, Pa., five 1200-hp switchers.

Duluth, Missabe & Iron Range, fifteen 1200-horsepower diesel switching units to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

Georgia, two 1500-hp general-purpose diesel units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Great Northern, 37 diesel units, awarded as follows: Electro-Motive Division, General Motors Corp., La Grange, Ill., four 1-unit 6000-hp freight locomotives, eleven 1500-hp road-switchers; American Locomotive-General Electric Companies, Schenectady, N. Y., five 1500-hp road-switchers; and Baldwin-Lima-Hamilton Corp., Eddystone, Pa., five 1200-hp road-switchers.

Kansas-Oklahoma & Gulf, one 1200-hp general-purpose diesel unit, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Midland Valley, four 1500-hp general-purpose diesel units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

New York, Susquehanna & Western, two 1000-hp road-switching diesel units, to the American Locomotive-General Electric Companies, Schenectady, N. Y.

Pennsylvania-Reading Seashore Lines, six 1500-hp road-switching diesel units, to the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

Spokane International, three 1000-hp road switching diesel units to American Locomotive-General Electric Companies, Schenectady, N. Y.

Western of Alabama, two 1200-hp general-purpose diesel units to Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Southern Pacific, 100 diesel locomotive units, contemplated; list includes 77 all-purpose freight and switching locomotives of 800 to 6000 hp., Pa switchers of 1200-hp and four passenger locomotives of 6250 hp., according to D. J. Russell, president; orders for this equipment will be placed soon with Electro-Motive Division, General Motors Corp., La Grange, Ill., American Locomotive Co., New York, Fairbanks Morse & Co., Chicago, and Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

Chicago & Northwestern, 837 freight cars, with 625 box cars going to the Pullman-Standard Car Mfg. Co., Chicago, 200 gondolas to the Bethlehem Steel Co., Bethlehem, Pa., and 12 cabooses to the International Railway Car Co., Kenton, O.

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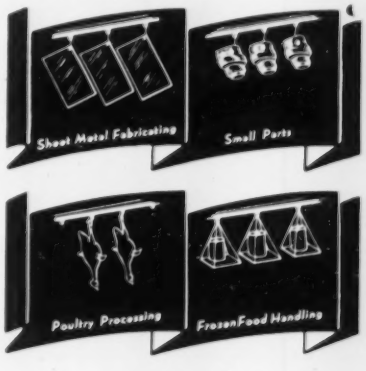

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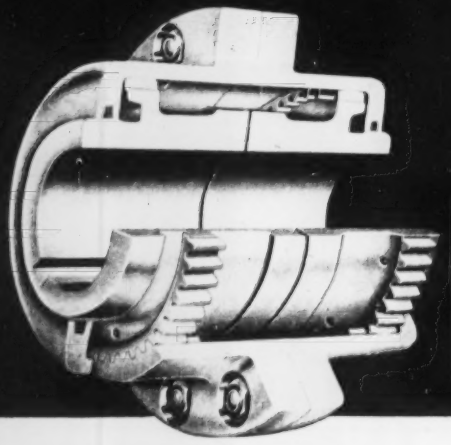

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Metalworking Notes

Stacks for Shipment

Stacks of electrical metallic tubing are arranged according to size at the Etna, Pa., plant of Spang-Chalfant division of the National Supply Co. After its manufacture here, tubing is placed in bins on the shipping floor and is then ready for quick shipment

Robert J. Krogman Honored

Robert J. Krogman, having completed 50 years' service with Pickands, Mather & Co., Chicago, was honored by the company with a dinner. Mr. Krogman is in charge of scheduling production and shipments of pig iron in Chicago.

Form Processing Company

Metal Briquettes Inc., Granville, Wis., is a new company formed to process machine shop scrap for use in foundries.

Atomic Work at Westinghouse

Westinghouse Electric Corp.'s Buffalo plant is producing equipment for the Atomic Energy Commission and is building components for the Navy's first atomic-powered submarine.

Constructs Plant Addition

International Homes Inc. is building a 22,000-square-foot addition to its Mineral Ridge, O., plant.

Takes 60-Day Option

Diamond Alkali Co., Cleveland, has a 60-day option to purchase stock of the Belle Alkali Co., Belle, W. Va., or to acquire the right to use the Belle process for chlorination of methane.

Iron Fireman Expands

Iron Fireman Mfg. Co., Cleveland, announced that two new assembly lines, a heavy investment in additional plant machinery and substantial changes in some types of heating equipment will help meet sharply expanded production schedules in the coming year.

Plans Louisiana Building

Commercial Solvents Corp., producer of methanol, ammonia and nitrogenous fertilizers, awarded a contract to Luria Engineering Co. for a 16,000-square-foot plant to be built in Sterlington, La.

Three Distributors Appointed

Stewart Warner Corp., Chicago, announced three new distributor appointments. The companies are Alemite Co. of Boston, Stewart Warner Alemite Sales Co., Hartford, Conn., and the Alemite Co. Inc., Des Moines, Iowa.

Chicago Warehouse Opened

Vanadium-Alloys Steel Co., Latrobe, Pa., opened a new warehouse in Chicago at 6632 W. Diversey Ave.

Buy Detroit Machine Company

Gear Grinding Machine Co., Detroit, was purchased by a group of New York businessmen. Company business will be continued in Detroit and the name will remain the same but it will be incorporated in Delaware.

Buffalo Plant To Open Soon

The Ernst Construction Corp.'s new steel fabrication plant in Buffalo will begin operation late this spring, according to Elmer M. Ernst, president. The new plant will employ between 300 and 500 men in fabrication of buildings, bridges and various steel equipment.

Hunter Moves Facilities

Hunter Foundry Co. Inc., producer of brass, bronze and aluminum castings, located for 11 years in Chicago, purchased a plant in Mokena, Ill., and moved its operations there. Company offices will be maintained in Chicago.

Zinc Mining Dips

Domestic mine production of recoverable zinc decreased to 661,023 tons

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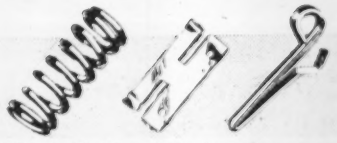

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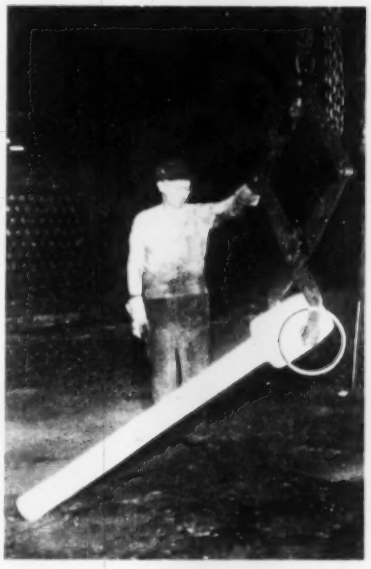
in 1952, 3 per cent below the 1951 total, according to the Bureau of Mines. Reduced output and a marked drop in zinc price in the second half of the year were a result of decreased demand and increased world-wide availability of zinc. Regionally, the greatest decrease was in the West, where production declined 4 per cent from the 1951 total.

Zinc Oxide Output Rises

Total zinc oxide production in the U. S. in December, 1952, was 16,325 net tons, or 2 per cent above the November production, and the highest monthly figure since November, 1951, the Bureau of Mines reports.



Swing's the Thing

Addition of a tilting device at the tips of the grasping fingers adds versatility to automatic tongs manufactured by the Heppenstall Co., Pittsburgh. Here they swing a hot forging from horizontal to vertical to put in a press

Ohmart Opens Sales Offices

Ohmart Corp., Cincinnati, opened district sales offices in Chicago and Dallas. Ohmart produces nuclear radiation measuring instruments for industrial, scientific and medical use.

Develops Machine Models

Warner & Swasey Co., Cleveland, announced development of two new machine tool models extending the size range of the company's automatic designs.

Elected by Standards Group

William L. Healy of General Electric Co., Philadelphia, was elected president of the Standards Engineers Society for 1953. Madhu S. Gokhale, Radio Corp. of America, Camden, N. J., was named vice president of the association.

Form Subcontractors Group

Formation of a medium of representation for local subcontracting firms was announced in Los Angeles. The group is called the Metalworking Subcontractors Association.

Distributors Appointed

Firth Sterling Inc., Pittsburgh, announced six authorized distributors. They are: Allen Supply Co. Inc., Cedar Rapids, Iowa; Lewis Industrial

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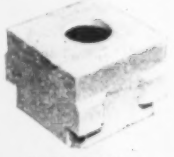
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METALWORKING NOTES

Supply Co., Louisville; Northern Indiana Supply Co., Kokomo, Ind.; Diamond Supply Co. Inc., Evansville, Ind.; Mills Supplies Inc., New Britain, Conn., and Phinney Steel Corp., Medina, N. Y.

Trojan Acquires Foundry

Meneely Bell Co. foundry property in Troy, N. Y., was sold to the Trojan Packing Co. The foundry had been used for bell-making since 1870.

Seaporcel Names Agents

Seaporcel Metals Inc., Long Island City, N. Y., fabricator of architectural and marine porcelain enamel products, appointed four firms as sales agents in different sections of the country. The companies are: Shull Building Products Corp., Charlotte, N. C.; Burlington Agency, Muncie, Ind.; Tennessee Structural Products Corp., Knoxville, Tenn. and Art Jones Co., Denver.

Chicago Expenditures Reported

The Chicago Association of Commerce & Industry announces that plans for investment in the Chicago metropolitan area during January called for total expenditures of $17,907,000.

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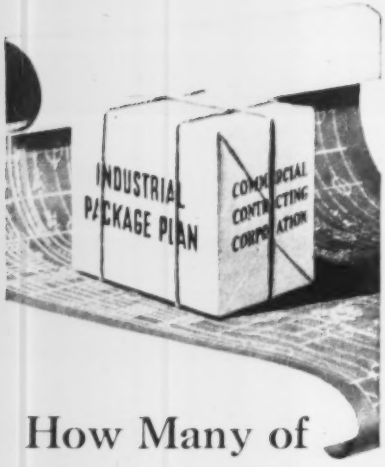

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Yale & Towne Mfg. Co., Philadelphia, thinks there are enough places where industrial trucks, hoists and attachments should be added that it is putting a traveling materials handling show on the road to carry its demonstrators right to the back yard of businesses, big and little, everywhere in the country.

Two-Year Tour—The show's first stand was in Miami, Fla., last week. Before the tour is over, two large truck-trailers will have toted the 40-foot by 68-foot big top and its paraphernalia twice across the continent, up into Canada, down into Mexico 25,000 miles and two years away from opening night.

Pointing out that 33 1/3 cents of every production dollar spent in the United States now goes for materials handling, Elmer F. Twyman, vice president of Yale & Towne, says there is a compelling need of taking modern materials handling experience to thousands of businesses and hundreds of communities that are not yet fully aware of the labor-aiding, cost-saving functions such equipment contributes to industry.

Penetration—"The only thing that has retarded wider application of modern materials handling operations, particularly in smaller plants, has been the lack of awareness in many places of what modern handling equipment can do. Through our traveling materials handling equipment show we hope to take the lesson home, right to the backyard of business, big, little, everywhere in the country," Mr. Twyman explains.

Itinerary—Places where the show will play the next two weeks are: New Orleans, Mar. 4; Shreveport, La., Mar. 6; Beaumont, Tex., Mar. 9; Houston, Mar. 11; and San Antonio, Tex., Mar. 13. Before the show reaches the Fifth National Materials Handling Show in Philadelphia in May, it will play in Dallas, Oklahoma City, Tulsa, Memphis, Chattanooga, Atlanta, Birmingham, Mobile, Raleigh, Norfolk, Richmond, Washington and Baltimore.

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Why Lift Extra Tonnage?

Walker Lifting Magnet operates with valuable saving of electrical energy . . . high ratio lifting magnet gives maximum lifting with minimum weight. Walker's advanced design insures more payload per lift . . . gets into corners . . . reduces supplementary hand work.

LESS WEIGHT — MORE POWER!

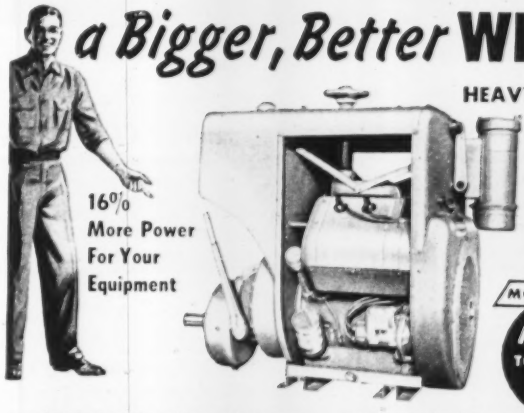
O. S. WALKER CO. Inc.

WORCESTER 6, MASSACHUSETTS

a Bigger, Better WISCONSIN

HEAVY-DUTY *Air-Cooled*

ENGINE



16% More Power For Your Equipment

The NEW Model VG4D 25 to 36 H.P.

MORE Power TO FIT THE JOB

MORE Power TO FIT THE MACHINE

Another engineering achievement . . . the NEW Model VG4D V-type 4-cylinder Wisconsin Heavy-Duty Air-Cooled Engine, increasing the power range to 36 hp. — a power gain of more than 16% over the VP4D, former top engine in the line.

The NEW Model VG4D is an exceptionally smooth-running, even-firing engine. Its light weight and compactness in design simplify the problem of engine installation on modern equipment where weight and space limitations are important factors.

Every one of the traditional Wisconsin 4-cylinder features are built into this new model. These include, to name a few, tapered roller main bearings, dynamically balanced forged crankshaft, mirror finish on crank pins, Stellite-faced exhaust valves and valve seat inserts and honed cylinders for long, dependable, heavy-duty engine life.

The Model VG4D engine is definitely Tops in Performance, delivering a maximum of power per pound of engine weight, at minimum operating and maintenance costs.

We invite your request for complete detailed specifications.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A 7556-¼

PANGBORN
BLAST CLEANING
GIVES YOU FASTER, CHEAPER MAINTENANCE

Either a Portable Unit to Clean Structures...

Pangborn Blast Cleaning Machine—Cleans tanks, bridges, buildings, and other structures quickly and economically. Ideal for maintenance and other jobs, such as removal of dirt, scale, rust, etc. preparatory to painting. Six sizes, stationary or portable, from **$170** and up.

Or a Compact Cabinet for Small Pieces

Pangborn Blast Cabinet—Saves time and money in cleaning small metal parts removing rust, scale, grime, old paint, etc. Produces smooth, clean surfaces on pieces up to 60" x 35" in size. Models from **$319** and up.

Pangborn Unit Dust Collectors—Trap dust at the source. Minimize maintenance, allow reclamation of valuable material. **$286** and up.

Pangborn Hydro-Finish Cabinets—Remove directional grinding lines, hold tolerances to .0001". Reduce further finishing of tools, molds, dies. **$1410** and up.

●

Write for details on these machines to PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment.

Pangborn

BLAST CLEANS CHEAPER

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HERE'S THE FIRST HIGH CONVECTION ANNEALING FURNACE DESIGNED ESPECIALLY FOR 430 CHROME STAINLESS STEEL

A typical charge of coils weighing approximately 32 tons.

Lee Wilson

ENGINEERING *Co., Inc.*

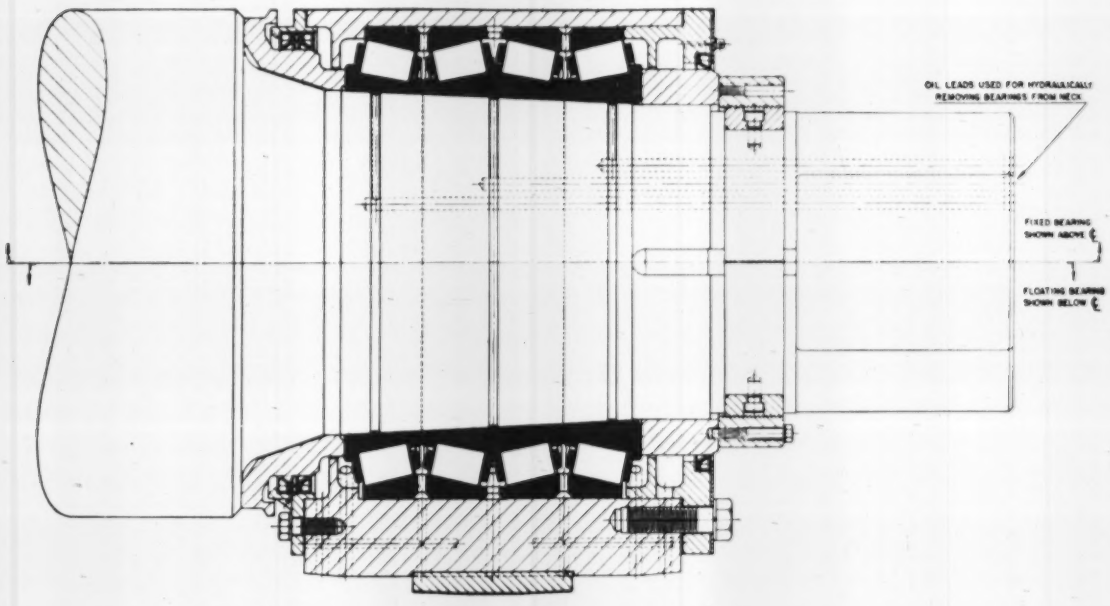
20005 WEST LAKE ROAD • CLEVELAND, OHIO
Telephone ED-1-6600

Completely designed and built especially for annealing 430 chrome stainless steels, this line of Lee Wilson radiant convector furnaces was recently installed in the West Leechburg, Pa., plant of the Allegheny Ludlum Steel Corporation.

Designed for operation at 1525° F. and for a charge 60" in diameter by 120" in height, the yield per furnace is presently averaging 1 ton per hour, and a still better average is anticipated in the near future.

BELL TYPE FURNACES ★ RADIANT TUBE HEATING ★ ANNEALING PROCESSES

New tapered bore TIMKEN® bearing has interference fit—yet is easy to remove



THE world's first 4-row tapered roller bearing with a tapered bore—recently announced by The Timken Roller Bearing Company—is now in service at a midwestern steel mill. The new bearing provides maximum bearing capacity for high-speed roll necks, has an interference fit, yet can be quickly removed from the roll neck by expanding its cones hydraulically. Excessive scuffing and neck wear are eliminated.

Two-row Timken® roller bearings with double cone and tapered bore have been available for a long time. However, this is the first 4-row tapered bore bearing. It's the greatest development in roll neck bearing design since the Timken Company pioneered the first balanced proportion bearing in 1941.

Like other Timken roll neck bearings, this new tapered bore bearing permits maximum roll neck size and greater mill rigidity, eliminates the need for special thrust bearings and makes possible higher rolling mill speeds. Mills can be stopped and started without the loss of steel.

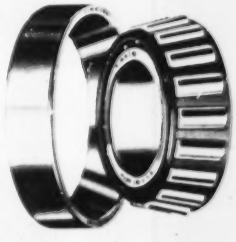
For additional information on the new 4-row, tapered bore bearing for roll necks, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

FREE! NEW ROLLING MILL EQUIPMENT SECTION OF THE TIMKEN COMPANY'S ENGINEERING JOURNAL

Just off the press! 165 pages and over 400 design illustrations describe and illustrate bearing applications in all types of rolling mill equipment. Includes five pages on the new tapered bore, 4-row bearing. Write on your company letterhead to The Timken Roller Bearing Company, Canton 6, Ohio

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION